United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with University of Georgia, College of Agriculture and Environmental Sciences, Agricultural Experiment Stations; United States Forest Service; and United States Fish and Wildlife Service, Piedmont National Wildlife Refuge

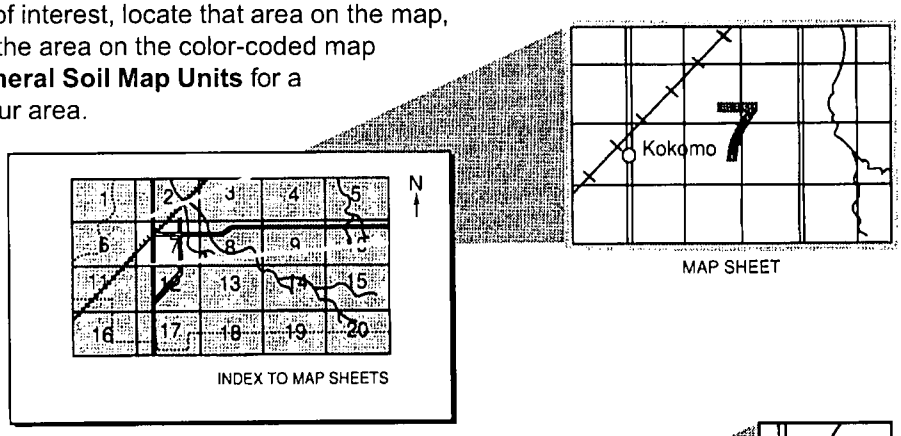
Soil Survey of Jasper County, Georgia

How to Use This Soil Survey

General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

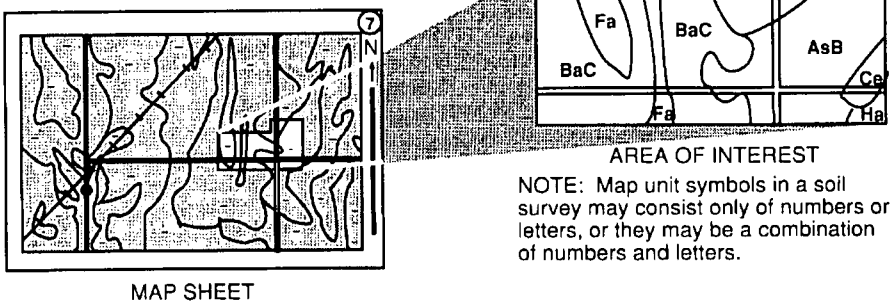


Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1995. Soil names and descriptions were approved in 1995. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1995. This soil survey was made cooperatively by the Natural Resources Conservation Service; the University of Georgia, College of Agriculture and Environmental Sciences, Agricultural Experiment Stations; the United States Forest Service; and the United States Fish and Wildlife Service, Piedmont National Wildlife Refuge. The survey is part of the technical assistance furnished to the Upper Ocmulgee River Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

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Cover: Fescue and clover pasture in an area of Lloyd loam, 2 to 6 percent slopes.

Contents

Foreword

This soil survey contains information that affects land use planning in Jasper County. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various decisions for land use or land treatment. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Earl Cosby
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Jasper County, Georgia

By James R. Lathem, Natural Resources Conservation Service

Fieldwork by James R. Lathem and Grover J. Thomas, Jr., Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
the University of Georgia, College of Agriculture and Environmental Sciences,
Agricultural Experiment Stations; the United States Forest Service; and the
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JASPER COUNTY is in the north-central part of Georgia (fig. 1). The land area is 374 square miles, or 239,200 acres. Monticello is the county seat. Elevation ranges from about 840 feet above sea level, at Barnes Mountain in the northwestern part of the county, to about 400 feet, at the Jones County line along the Ocmulgee River.

Jasper County is in the Southern Piedmont Major Land Resource Area. Most of the soils on uplands are well drained and have a loamy surface layer and a clayey subsoil in shades of red or dark red. Soils that have a thicker subsoil are commonly associated with the broader, gently sloping ridges and sloping hillsides. Soils that have a less thick subsoil are commonly associated with strongly sloping to steep hillsides and side slopes. Nearly level soils on flood plains are well drained to poorly drained and are mainly loamy throughout.

This soil survey updates the survey of Jasper County published in 1916 *(8)*. It provides additional information and has larger maps, which show the soils in greater detail.

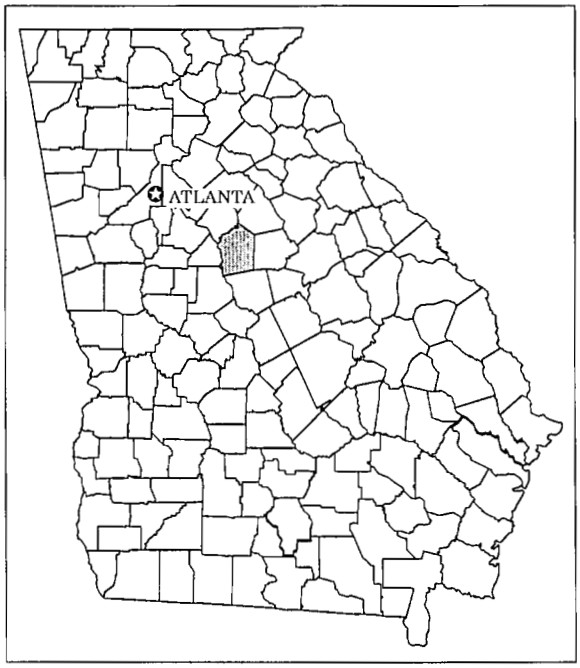

Figure 1.—Location of Jasper County in Georgia.

General Nature of the County

This section provides general information about Jasper County. It describes the settlement and history, cultural resources, agriculture and forestry, water resources, geology, and climate.

Settlement and History

Prior to 1805, the survey area was inhabited by the Creek Indians. The Creek Cessions of 1802 and 1805

provided a large oval area of land between the Ocmulgee and Oconee Rivers. This land was named Baldwin County *(4)*.

Jasper County was formed from a portion of Baldwin County by an act of the Georgia Legislature on December 10, 1807. The survey area was originally named Randolf County but became Jasper County on December 10, 1812, in honor of Sergeant William Jasper, a hero of the Revolutionary War. Monticello officially became the county seat on December 10, 1808. It was named in honor of President Thomas Jefferson's Virginia estate called Monticello *(4)*.

Most of the earliest settlers in Jasper County came from other areas of Georgia but were Virginians by birth *(8)*. Rural development and population growth were rapid during the early years due to favorable farming conditions. By 1820, the population of the county was 14,614 *(4)*. It declined slightly in the mid-1800's and increased in the late 1800's and early 1900's. It declined sharply in the 1920's due largely to the decline in agriculture. In 1990, the population of the county was 8,453 *(14)*.

Cultural Resources

Cultural resources are the past events, activities, and accomplishments of people. They include historic sites, buildings, structures, features, and objects. Jasper County has significant cultural resources that indicate the past cultures of both Indians and settlers.

The Indians that inhabited the survey area typically made their homes along the larger rivers and streams. They also made camps on other upland sites within close proximity to dependable water supplies. A large population of Indians who lived along the Ocmulgee River grew corn in the bottomland and speared fish along the shoals and riverbanks *(4)*. Artifacts found in these areas include projectile points, knives, and other tools made from chert and quartz rock. Stone axes, grinding stones, and shards of clay pottery are other Indian artifacts found in the survey area.

Grave sites and cemeteries are scattered throughout Jasper County. Some grave sites of early settlers and slaves are distinguishable only by unmarked headstones of rough hewn or selected rock. Other graves are marked by two rocks—one rock at the head of the grave and one rock at the foot *(5)*. All grave sites and cemeteries located during the course of this survey are identified on the soil maps by a special symbol. Because many grave sites probably were overlooked or remain undiscovered, the soil survey should not be considered as a complete source of this information.

Ruins of grist mills that operated during the 1800's and early 1900's are also located in the county. These mills were operated to grind corn into meal. Foundations of rough hewn rock next to flowing streams make up the remains of these once important sites. Grist mills were favorite gathering places, and small communities grew up around some of them *(5)*. Early factories were located near some grist mills where water power was sufficient *(4)*.

Old stone chimneys and foundations located in scattered areas throughout the county commonly mark the homesites of early settlers. Many of the earliest homesites were situated near flowing water. Dug wells provided water for other homesites. Open wells are still common, and caution should be used around abandoned homesites. Artifacts and graves may also be found near old homesites.

Other important cultural resources in Jasper County include structures listed on the National Register of Historic Places and such landmarks as Dow's Pulpit and Jackson Springs.

Agriculture and Forestry

Cindy Lewis, Soil Conservation Technician, Jasper County, helped prepare this section.

Prior to the 1800's, the survey area had virgin forests of oak, hickory, yellow-poplar, gums, and pines. Soon after the Indian treaties were signed, settlers began clearing the land to build homes, market timber, and cultivate crops such as corn and cotton. By 1830, another transition had begun; small farmers began selling their land to cotton plantation owners. Improvements in transportation and the invention of the cotton gin enabled Jasper County to become one of the three leading cotton-growing counties in the state by the 1840's. In 1911, the largest cotton crop in the county was grown and 32,000 bales were sold. Producers of perishables, such as peaches, also profited from transportation improvements. By the late 1800's, about 10,000 acres of the county was devoted to growing peaches *(4)*.

By the early 1900's, soil erosion caused by farming without the use of adequate conservation measures had depleted much of the topsoil in the county. In addition, boll weevil infestations made it no longer feasible to economically produce cotton, which had once been Jasper County's main cash crop. Many farms were abandoned, and the land was left barren and exposed to continuous and excessive erosion.

Conservationists became increasingly aware that the land needed to be protected. In 1937, legislation by the State of Georgia established Soil Conservation Districts. This enactment was supported by the leading

farmers of Jasper County. In June of 1938, Jasper County became part of the Upper Ocmulgee River Soil and Water Conservation District *(7)*. Farmers began using crop rotations, terraces, grassed waterways, improved pastures, and ponds to control erosion and increase land productivity. Many seriously eroded, previously cultivated fields were planted to grass or trees.

In 1935, the Federal Government began purchasing many of the abandoned and eroded farms in the southern part of the county. Conservation measures were quickly established, and pine trees were planted. Federal agencies now own and manage over 30,000 acres of the county's forest land. About 12.5 percent of the county is included in the Oconee National Forest, and about 2.5 percent is included in the Piedmont National Wildlife Refuge *(10)*.

Since the 1940's, the demand for lumber and pulpwood has grown and forest products have become increasingly important to the economy of Jasper County. In 1989, approximately 78 percent of the county's total land area was forest land. The largest percentage of this land is privately owned *(9)*.

Although the production of row crops has greatly declined since the early part of this century, agriculture is still an important part of the county's economy. Wheat and corn are now the most commonly produced agricultural crops. The commercial poultry industry began around 1960, and production has steadily increased. In 1992, the county had 1,306,042 layers and 333,871 broilers. The number of cattle has also increased in this century. In 1992, the county had 8,945 head of beef cattle and 1,427 dairy cows *(15)*.

Water Resources

The most abundant surface water resources in Jasper County are the Ocmulgee River, Murder Creek, Cedar Creek, and Gap Creek. Jackson Lake is also partially within the county.

Many watersheds supply perennial streams throughout the county. Water may flow only during wet periods in the upper reaches of these watersheds. Most of the perennial streams are adjacent to flood plains. Except in dredged or other artificially altered areas, these streams frequently overflow their banks onto the flood plains during periods of heavy rains.

Many manmade ponds have been constructed along streams in the county. These ponds are used for watering livestock, recreational activities, municipal water supplies, and irrigation.

The county has numerous shallow ponds and wetland areas as a result of high beaver activity. These ponds and wetland areas are located along perennial streams.

Drilled or bored wells supply water throughout the county for domestic use and private water systems. Drilled wells commonly are more than 200 feet in depth. Water supplies from wells are usually adequate for domestic use; however, supply rates may be inconsistent, even in the same general area.

Geology

William Fulmer, Geologist, Natural Resources Conservation Service, helped prepare this section.

Jasper County is within the Washington Slope District of the Piedmont Physiographic Province and the Piedmont Major Land Resource Area. The Washington Slope District is characterized by a gentle, undulating surface which drops gradually from an elevation of 700 feet to about 450 feet in the southern part of the county.

Soils in the survey area are the weathering products of a somewhat varied geology which consists of a more typical biotite gneiss, mica schist, and amphibolite associations of metavolcanic and metasedimentary rocks of the Carolina series. Hornblende gneiss is widely distributed within the Carolina series, and a wide belt of hornblende rocks, trending in a northeast direction, occupies a large part of central and southwestern Jasper County. Within the hornblende gneiss, in areas south and southwest of Monticello, are two distinct outcrop zones that are approximately 1 mile by 7.5 miles in size and consist primarily of an olivine gabbro. These zones are marked by numerous dark boulders and interspersed rock float.

To the northeast and south, the fine-grained hornblende gneiss is in contact with granite gneiss. Within the granite gneiss are gradations from hornblende to biotite granite gneiss and hornblende inclusions. Mica schist and biotite gneiss containing varying amounts of amphibole provides the parent material for the soils in western and northwestern Jasper County.

The Towaliga Fault, a steep, northward-dipping thrust fault, trends in a northeast direction across the western edge of the county. A narrow bank of mylonite denotes the contact for this fault.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Monticello, Georgia, in the period 1961 to 1990. Table 2 shows probable

dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 45.3 degrees F and the average daily minimum temperature is 34.3 degrees. The lowest temperature on record, which occurred on January 21, 1985, is -7 degrees. In summer, the average temperature is 78.5 degrees and the average daily maximum temperature is 89.3 degrees. The highest recorded temperature, which occurred on July 19, 1986, is 103 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total average annual precipitation is 47.72 inches. Of this, about 25.81 inches, or 54 percent, usually falls in April through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 11.41 inches on March 11, 1952. Thunderstorms occur on about 55 days each year, and most occur in July.

The average seasonal snowfall is 0.8 inch. The greatest snow depth at any one time during the period of record was 15 inches, recorded on February 10, 1973.

The average relative humidity in midafternoon is about 54 percent. Humidity is higher at night, and the average at dawn is about 87 percent. The prevailing wind is from the west-northwest. Average windspeed is highest, 9.1 miles per hour, in March. Every few years in summer or fall, a tropical depression or remnant of a hurricane which has moved inland causes extremely heavy rains and possibly wind damage.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify the soils. After describing the soils and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area are generally collected for laboratory analyses and for engineering tests. The data from these analyses and tests and from field-

observed characteristics and soil properties are used to predict behavior of the soils under different uses. Interpretations are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a relatively high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in accurately locating boundaries.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

General Soil Map Units

The general soil map shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or a building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

1. Chewacla-Toccoa-Roanoke

Nearly level, well drained to poorly drained soils that have a loamy surface layer and a loamy underlying layer or a clayey subsoil; on flood plains

Setting

Landscape position: Chewacla—slightly lower parts of the flood plain; Toccoa—slightly higher parts of the flood plain, closer to the stream channel; Roanoke—depressions, backswamps, and sloughs of the flood plain
Slope range: 0 to 2 percent
Flooding: Frequent
Hydrologic features: Sloughs, depressions, and beaver ponds which occur throughout the unit
Land uses: Woodland
Cultural features: No significant features
Visual diversity: Very low

Extent and Composition

Percent of the survey area: 1
Chewacla soils—50 percent
Toccoa soils—20 percent
Roanoke soils—10 percent
Minor soils—20 percent

Typical Profile

Chewacla

Surface layer:
0 to 6 inches—brown silt loam

Subsoil:
6 to 20 inches—brown silty clay loam that has yellowish brown mottles
20 to 32 inches—brown silty clay loam that has grayish brown and pale brown mottles
32 to 38 inches—dark grayish brown sandy clay loam that has strong brown mottles

Substratum:
38 to 44 inches—dark grayish brown sandy clay loam
44 to 52 inches—brown silty clay loam
52 to 58 inches—dark grayish brown loamy sand
58 to 65 inches—dark grayish brown silty clay loam

Toccoa

Surface layer:
0 to 4 inches—brown fine sandy loam

Underlying material:
4 to 22 inches—strong brown sandy loam
22 to 35 inches—yellowish red sandy loam
35 to 43 inches—yellowish red loamy sand
43 to 57 inches—yellowish red sandy loam
57 to 60 inches—mottled strong brown, brown, and dark yellowish brown loam

Distinctive features: Bedding planes and thin strata of sandy or loamy texture which occur throughout the underlying material

Roanoke

Surface layer:
0 to 8 inches—very dark grayish brown silt loam

Subsoil:
8 to 42 inches—dark grayish brown silty clay
42 to 60 inches—dark grayish brown silty clay loam

Minor Soils

- Altavista soils, which are on stream terraces adjacent to the flood plain
- Buncombe soils, which are on the sandy levees adjacent to the main channel of the creek or river
- Shellbluff soils, which are on the slightly higher part of the flood plain

Use and Management

Major management concerns: Seasonal wetness and flooding
Suitability for field crops: Moderately suited to unsuited
Suitability for hay and pasture: Well suited to unsuited
Potential productivity for woodland: Very high or high
Suitability for urban uses and recreational development: Unsuited

2. Iredell-Mecklenburg

Nearly level to sloping, somewhat poorly drained to well drained soils that have a loamy surface layer and a clayey subsoil that is sticky and plastic; on upland flats, ridges, and hillsides in the southwestern part of the county

Setting

Landscape position: Iredell—upland flats and hillsides; Mecklenburg—ridges and hillsides
Slope range: 0 to 10 percent
Hydrologic features: Few intermittent drainageways
Land uses: Mainly woodland
Cultural features: Few roads and powerlines
Visual diversity: Low

Extent and Composition

Percent of the survey area: 2.5
Iredell soils—50 percent
Mecklenburg soils—25 percent
Minor soils—25 percent

Typical Profile

Iredell

Surface layer:
0 to 5 inches—brown fine sandy loam

Subsoil:
5 to 24 inches—dark yellowish brown clay

Substratum:
24 to 40 inches—mottled yellowish brown, yellow, and dark gray saprolite that crushes to sandy clay loam
40 to 60 inches—mottled very pale brown, light brownish gray, and gray saprolite that crushes to sandy loam

Mecklenburg

Surface layer:
0 to 8 inches—dark brown loam

Subsoil:
8 to 15 inches—reddish brown clay
15 to 26 inches—yellowish red clay that has brownish yellow mottles
26 to 33 inches—brown clay loam that has red and yellow mottles

Substratum:
33 to 42 inches—mottled yellowish red, light olive brown, and yellow saprolite that crushes to clay loam
42 to 60 inches—light olive brown saprolite that crushes to clay loam and has very pale brown and yellowish red mottles

Minor Soils

- Madison, Wilkes, and Zion soils, which are on hillsides
- Chewacla and Roanoke soils, which are on flood plains

Use and Management

Major management concerns: Erosion in unprotected areas; seasonal wetness in areas of the Iredell soils when heavy equipment is used
Suitability for field crops, hay, and pasture: Well suited or moderately suited
Potential productivity for woodland: High
Suitability for urban uses and recreational development: Moderately suited or poorly suited

3. Lloyd-Cecil

Gently sloping and sloping, well drained soils that have a loamy surface layer and a dark red and red subsoil; on ridges and hillsides mainly in the southern part of the county

Setting

Landscape position: Ridges and hillsides
Slope range: 2 to 10 percent
Hydrologic features: Intermittent drainageways and a few small, manmade ponds
Land uses: Mainly pastureland and woodland; some cropland
Cultural features: Roads, powerlines, buried pipelines

and telephone cables, fences, schools, factories, homes, and farm structures
Visual diversity: Very high

Extent and Composition

Percent of the survey area: 27
Lloyd soils—55 percent
Cecil soils—10 percent
Minor soils—35 percent

Typical Profile

Lloyd

Surface layer:
0 to 9 inches—dark reddish brown loam

Subsoil:
9 to 17 inches—dark red clay loam
17 to 33 inches—dark red clay
33 to 46 inches—red clay
46 to 56 inches—red clay loam

Substratum:
56 to 60 inches—red saprolite that crushes to loam

Cecil

Surface layer:
0 to 8 inches—brown sandy loam

Subsoil:
8 to 11 inches—reddish brown sandy clay loam
11 to 24 inches—red sandy clay
24 to 37 inches—red sandy clay that has reddish yellow mottles
37 to 48 inches—red sandy clay loam that has reddish yellow and faint red mottles

Substratum:
48 to 60 inches—red and reddish yellow saprolite that crushes to sandy clay loam

Minor Soils

- Chewacla and Toccoa soils, which are on flood plains
- Gwinnett, Madison, Mecklenburg, and Pacolet soils, which are on hillsides

Use and Management

Major management concerns: Erosion in unprotected areas
Suitability for field crops: Well suited to poorly suited
Suitability for hay and pasture: Well suited or moderately suited
Potential productivity for woodland: High
Suitability for urban uses and recreational development: Well suited or moderately suited

4. Pacolet-Cecil-Lloyd

Gently sloping and sloping, well drained soils that have a loamy surface layer and a dominantly red clayey subsoil; on ridges and hillsides mainly in the northern part of the county

Setting

Landscape position: Ridges and hillsides
Slope range: 2 to 10 percent
Hydrologic features: Intermittent drainageways and a few small, manmade ponds
Land uses: Mainly pasture and woodland; some cropland
Cultural features: Roads, powerlines, buried pipelines and telephone cables, fences, homes, and farm structures
Visual diversity: High

Extent and Composition

Percent of the survey area: 18.5
Pacolet soils—35 percent
Cecil soils—30 percent
Lloyd soils—20 percent
Minor soils—15 percent

Typical Profile

Pacolet

Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—mottled red, yellowish red, and pink saprolite that crushes to sandy clay loam
54 to 60 inches—mottled red, yellowish red, and very pale brown saprolite that crushes to sandy loam

Cecil

Surface layer:
0 to 8 inches—brown sandy loam

Subsoil:
8 to 11 inches—reddish brown sandy clay loam
11 to 24 inches—red sandy clay
24 to 37 inches—red sandy clay that has reddish yellow mottles
37 to 48 inches—red sandy clay loam that has reddish yellow and faint red mottles

Substratum:
48 to 60 inches—red and reddish yellow saprolite that crushes to sandy clay loam

Lloyd

Surface layer:
0 to 9 inches—dark reddish brown loam

Subsoil:
9 to 17 inches—dark red clay loam
17 to 33 inches—dark red clay
33 to 46 inches—red clay
46 to 56 inches—red clay loam

Substratum:
56 to 60 inches—red saprolite that crushes to loam

Minor Soils

- Appling soils, which are on ridges
- Gwinnett and Madison soils, which are on hillsides
- Chewacla and Toccoa soils, which are on flood plains

Use and Management

Major management concerns: Erosion in unprotected areas
Suitability for field crops, hay, and pasture: Well suited or moderately suited
Potential productivity for woodland: High
Suitability for urban uses and recreational development: Well suited or moderately suited

5. Molena-Madison-Red Bay

Gently sloping to strongly sloping, somewhat excessively drained and well drained soils that have a sandy or loamy surface layer and a sandy, loamy, or clayey subsoil; on terraces and hillsides in the southwestern part of the county

Setting

Landscape position: Molena—stream terraces; Madison—hillsides; Red Bay—high stream terraces
Slope range: 2 to 12 percent
Hydrologic features: Adjacent or nearby river flood plains
Land uses: Woodland
Cultural features: Few roads
Visual diversity: Very low

Extent and Composition

Percent of the survey area: 0.5
Molena soils—35 percent
Madison soils—20 percent
Red Bay soils—15 percent
Minor soils—30 percent

Typical Profile

Molena

Surface layer:
0 to 10 inches—dark brown loamy sand

Subsoil:
10 to 25 inches—dark brown loamy sand
25 to 42 inches—brown loamy sand

Substratum:
42 to 56 inches—strong brown sand
56 to 60 inches—yellowish red sand

Madison

Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 10 inches—yellowish red sandy clay
10 to 17 inches—red clay
17 to 24 inches—red sandy clay
24 to 38 inches—red sandy clay loam that has yellow and strong brown mottles

Substratum:
38 to 50 inches—mottled yellowish red, reddish yellow, and brown saprolite that crushes to sandy clay loam
50 to 60 inches—mottled brown, reddish yellow, and yellowish red saprolite that crushes to sandy loam

Distinctive features: Common or many flakes of mica in the upper part of the profile and many flakes of mica in the lower part of the solum

Red Bay

Surface layer:
0 to 8 inches—dusky red sandy loam

Subsoil:
8 to 22 inches—dark reddish brown sandy clay loam that has very dusky red streaks
22 to 44 inches—dark reddish brown sandy clay loam
44 to 62 inches—dark red sandy clay loam

Minor Soils

- Buncombe, Chewacla, and Shellbluff soils, which are on adjacent flood plains
- Wickham soils, which are on low stream terraces

Use and Management

Major management concerns: Equipment use limitation and seedling mortality, which are

problems in areas of the sandy Molena soils and in areas of the Madison soils that have eroded surface layers
Suitability for field crops: Well suited to poorly suited
Suitability for hay and pasture: Well suited or moderately suited
Potential productivity for woodland: Very high or high
Suitability for urban uses and recreational development: Well suited or moderately suited

6. Wilkes-Madison-Zion

Sloping to steep, well drained soils that have a loamy surface layer and a loamy or clayey subsoil and that have bedrock at a depth of less than 20 inches to more than 60 inches; on narrow ridges, shoulders, and hillsides mainly in the southern and northeastern parts of the county

Setting

Landscape position: Wilkes—narrow ridges and shoulders; Madison—hillsides; Zion—shoulders and hillsides
Slope range: 6 to 30 percent
Hydrologic features: Intermittent drainageways and perennial streams
Land uses: Mainly woodland
Cultural features: Few roads, powerlines, buried pipelines, and telephone lines
Visual diversity: Low

Extent and Composition

Percent of the survey area: 8
Wilkes soils—20 percent
Madison soils—20 percent
Zion soils—10 percent
Minor soils—50 percent

Typical Profile

Wilkes

Surface layer:
0 to 3 inches—brown sandy loam

Subsurface layer:
3 to 6 inches—yellowish brown sandy loam

Subsoil:
6 to 10 inches—dark yellowish brown sandy clay loam
10 to 18 inches—dark yellowish brown sandy clay loam that has yellow and reddish yellow mottles

Substratum:
18 to 45 inches—greenish black, yellowish brown, and gray weathered bedrock
45 inches—hard bedrock

Madison

Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 10 inches—yellowish red sandy clay
10 to 17 inches—red clay
17 to 24 inches—red sandy clay
24 to 38 inches—red sandy clay loam that has yellow and strong brown mottles

Substratum:
38 to 50 inches—mottled yellowish red, reddish yellow, and brown saprolite that crushes to sandy clay loam
50 to 60 inches—mottled brown, reddish yellow, and yellowish red saprolite that crushes to sandy loam

Distinctive features: Common or many flakes of mica in the upper part of the profile and many flakes of mica in the lower part of the solum

Zion

Surface layer:
0 to 6 inches—brown sandy loam

Subsoil:
6 to 16 inches—yellowish red clay that has strong brown mottles
16 to 25 inches—yellowish red clay loam that has red mottles

Substratum:
25 to 28 inches—mottled dark yellowish brown, yellowish brown, and pale brown saprolite that crushes to sandy loam
28 to 33 inches—multicolored weathered bedrock
33 inches—hard mafic bedrock

Minor Soils

- Gwinnett, Lloyd, Mecklenburg, Pacolet, and Wynott soils, which are on hillsides
- Chewacla and Toccoa soils, which are on flood plains

Use and Management

Major management concerns: Erosion in unprotected areas; moderately steep and steep slopes which limit the use of heavy equipment on some of the soils; windthrow hazard where soils are shallow and moderately deep to bedrock
Suitability for field crops: Unsuited
Suitability for hay and pasture: Poorly suited
Potential productivity for woodland: High
Suitability for urban uses and recreational development: Poorly suited or unsuited

7. Lloyd-Gwinnett

Strongly sloping to steep, well drained soils that have a loamy surface layer and a dominantly dark red clayey subsoil; on hillsides mainly in the southern part of the county

Setting

Landscape position: Hillsides
Slope range: 10 to 30 percent
Hydrologic features: Intermittent drainageways and perennial streams
Land uses: Mainly woodland
Cultural features: Few roads, powerlines, buried pipelines and telephone cables, and fences
Visual diversity: Moderate or low

Extent and Composition

Percent of the survey area: 15.5
Lloyd soils—55 percent
Gwinnett soils—10 percent
Minor soils—35 percent

Typical Profile

Lloyd

Surface layer:
0 to 9 inches—dark reddish brown loam

Subsoil:
9 to 17 inches—dark red clay loam
17 to 33 inches—dark red clay
33 to 46 inches—red clay
46 to 56 inches—red clay loam

Substratum:
56 to 60 inches—red saprolite that crushes to loam

Gwinnett

Surface layer:
0 to 5 inches—dark reddish brown sandy loam

Subsoil:
5 to 28 inches—dark red sandy clay
28 to 39 inches—dark red sandy clay that has common fine flakes of mica

Substratum:
39 to 53 inches—dark red sandy clay loam that has yellowish red mottles
53 to 60 inches—highly weathered hornblende gneiss

Minor Soils

- Madison, Pacolet, Wilkes, and Zion soils, which are on hillsides
- Chewacla and Toccoa soils, which are on flood plains

Use and Management

Major management concerns: Erosion in unprotected areas; moderately steep and steep slopes which limit the use of heavy equipment
Suitability for field crops: Poorly suited or unsuited
Suitability for hay and pasture: Moderately suited or poorly suited
Potential productivity for woodland: Moderately high or high
Suitability for urban uses and recreational development: Moderately suited or poorly suited

8. Pacolet-Madison-Gwinnett

Strongly sloping to steep, well drained soils that have a loamy surface layer and a red or dark red subsoil; on hillsides

Setting

Landscape position: Hillsides
Slope range: 10 to 30 percent
Hydrologic features: Intermittent drainageways, perennial streams, and a few beaver ponds and manmade ponds
Land uses: Mainly woodland
Cultural features: Roads, powerlines, buried pipelines and telephone cables, and fences
Visual diversity: Moderate

Extent and Composition

Percent of the survey area: 27
Pacolet soils—45 percent
Madison soils—10 percent
Gwinnett soils—10 percent
Minor soils—35 percent

Typical Profile

Pacolet

Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—mottled red, yellowish red, and pink saprolite that crushes to sandy clay loam

54 to 60 inches—mottled red, yellowish red, and very pale brown saprolite that crushes to sandy loam

Madison

Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 10 inches—yellowish red sandy clay
10 to 17 inches—red clay
17 to 24 inches—red sandy clay
24 to 38 inches—red sandy clay loam that has yellow and strong brown mottles

Substratum:
38 to 50 inches—mottled yellowish red, reddish yellow, and brown saprolite that crushes to sandy clay loam
50 to 60 inches—mottled brown, reddish yellow, and yellowish red saprolite that crushes to sandy loam

Distinctive features: Common or many flakes of mica in the upper part of the profile and many flakes of mica in the lower part of the solum

Gwinnett

Surface layer:
0 to 5 inches—dark reddish brown sandy loam

Subsoil:
5 to 28 inches—dark red sandy clay
28 to 39 inches—dark red sandy clay that has common fine flakes of mica

Substratum:
39 to 53 inches—dark red sandy clay loam that has yellowish red mottles
53 to 60 inches—highly weathered hornblende gneiss

Minor Soils

- Ashlar, Lloyd, Rion, and Wedowee soils, which are on hillsides
- Chewacla and Toccoa soils, which are on flood plains

Use and Management

Major management concerns: Erosion in unprotected areas; moderately steep and steep slopes which limit the use of heavy equipment
Suitability for field crops: Poorly suited or unsuited
Suitability for hay and pasture: Moderately suited or poorly suited
Potential productivity for woodland: Moderately high or high
Suitability for urban uses and recreational development: Moderately suited or poorly suited

Detailed Soil Map Units

The map units delineated on the detailed maps represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the heading "Use and Management of the Soils."

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Lloyd loam, 2 to 6 percent slopes, is a phase of the Lloyd series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are called complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Wilkes-Zion complex, 6 to 15 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, quarry, is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Contents") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

AkA—Altavista sandy loam, 0 to 3 percent slopes, rarely flooded

Setting

Landscape position: Low stream terraces
Flooding: Rare
Slope: Nearly level or gently sloping
Slope topography: Plane

Typical Profile

Surface layer:
0 to 6 inches—brown sandy loam

Subsurface layer:
6 to 10 inches—pale brown sandy loam

Subsoil:
10 to 24 inches—yellowish brown sandy clay loam
24 to 36 inches—yellowish brown sandy clay loam that has light gray mottles

Substratum:
36 to 45 inches—mottled brownish yellow, strong brown, and gray sandy clay loam that has pockets of finer textured material
45 to 60 inches—mottled brownish yellow, strong brown, yellow, and gray stratified sandy loam and sandy clay loam

Soil Properties and Qualities

Drainage class: Moderately well drained
Depth to high water table: 1.5 to 2.5 feet
Natural fertility: Low
Organic matter content: Low or moderately low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep during most of the growing season

Inclusions

• A few small areas of Molena and Wickham soils, which are in the higher landscape positions

Use and Management

Land Uses: Mainly woodland; some pastureland and cropland

Field crops, hay, and pasture

Suitability: Well suited
Management concerns: Seasonal wetness and rare flooding
Management measures and considerations:
• Soil drainage systems generally help to reduce the wetness limitation.

Woodland

Potential productivity: Very high
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Unsuited
Limitations: Seasonal wetness and flooding
Management measures and considerations:
• A drainage and flood-control system helps to reduce the soil limitations.

Recreational development

Suitability: Moderately suited
Limitations: Seasonal wetness and flooding
Management measures and considerations:
• A drainage and flood-control system helps to reduce the soil limitations.

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: 9A

AmB—Appling sandy loam, 2 to 6 percent slopes

Setting

Landscape position: Ridges
Slope: Gently sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 6 inches—brown sandy loam

Subsoil:
6 to 10 inches—yellowish brown sandy clay loam
10 to 41 inches—yellowish brown sandy clay that has brownish yellow, yellowish red, and very pale brown mottles

41 to 51 inches—mottled yellowish brown, pale yellow, and strong brown sandy clay loam

Substratum:
51 to 60 inches—mottled yellowish brown, light yellowish brown, and red sandy clay that has pockets of sandy clay loam and sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- A few small areas of Cecil and Lloyd soils, which are in landscape positions similar to those of the Appling soil
- A few small areas of Wedowee soils, which are in the steeper landscape positions

Use and Management

Land Uses: Mainly pastureland and cropland; some woodland

Field crops, hay, and pasture

Suitability: Well suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Well suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.

Recreational development

Suitability: Well suited
Limitations: No significant limitations

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 8A

ApD—Ashlar-Pacolet complex, 2 to 15 percent slopes

Setting

Landscape position: Ashlar—shoulders and hillsides; Pacolet—hillsides
Surface features: Scattered stones and boulders in some areas
Slope: Gently sloping to strongly sloping
Slope topography: Undulating

Composition

Ashlar soil and similar soils: 45 percent
Pacolet soil and similar soils: 30 percent
Dissimilar soils: 25 percent
Pattern of occurrence: Ashlar and Pacolet soils occur in a regular repeating pattern; the proportion of each soil varies from one mapped area to another

Typical Profile

Ashlar

Surface layer:
0 to 7 inches—yellowish brown coarse sandy loam

Subsoil:
7 to 15 inches—brownish yellow coarse sandy loam

Substratum:
15 to 25 inches—brownish yellow loamy coarse sand
25 inches—hard bedrock

Pacolet

Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—mottled red, yellowish red, and pink saprolite that crushes to sandy clay loam
54 to 60 inches—mottled red, yellowish red, and very pale brown saprolite that crushes to sandy loam

Soil Properties and Qualities

Ashlar

Drainage class: Excessively drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderately rapid
Available water capacity: Low or very low
Tilth: Good
Root zone: Moderately deep

Pacolet

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- Wedowee soils, which are in landscape positions similar to those of the Ashlar and Pacolet soils
- Soils that are similar to the Ashlar soil and in similar landscape positions but are shallow to bedrock
- Soils that are similar to the Pacolet soil and in similar landscape positions but have soft bedrock within a depth of 60 inches

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Poorly suited
Suitability for hay and pasture: Moderately suited
Management concerns: Erosion in unprotected areas and low available water capacity in the Ashlar soil
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
- Returning crop residue to the soil helps to retain soil moisture.

Woodland

Potential productivity: Moderately high
Preferred trees to plant: Loblolly pine
Management concerns: Windthrow in areas of the Ashlar soil resulting from the depth to hard bedrock; erosion in unprotected areas
Management measures and considerations:
- Performing planting operations on the contour helps to minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Depth to bedrock in areas of the Ashlar soil
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.

Recreational development

Suitability: Moderately suited
Limitations: Slope; depth to bedrock in areas of the Ashlar soil
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: Ashlar—IVe; Pacolet—IIIe
Woodland ordination symbol: Ashlar—8S; Pacolet—8A

ApE—Ashlar-Pacolet complex, 15 to 25 percent slopes

Setting

Landscape position: Ashlar—shoulders and hillsides; Pacolet—hillsides
Surface features: Scattered stones and boulders in some areas
Slope: Moderately steep
Slope topography: Undulating

Composition

Ashlar soil and similar soils: 55 percent
Pacolet soil and similar soils: 25 percent
Dissimilar soils: 20 percent
Pattern of occurrence: Ashlar and Pacolet soils occur in a regular repeating pattern; the proportion of each soil varies from one mapped area to another

Typical Profile

Ashlar

Surface layer:
0 to 7 inches—yellowish brown coarse sandy loam

Subsoil:
7 to 15 inches—brownish yellow coarse sandy loam

Substratum:
15 to 25 inches—brownish yellow loamy coarse sand
25 inches—hard bedrock

Pacolet

Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—mottled red, yellowish red, and pink saprolite that crushes to sandy clay loam
54 to 60 inches—mottled red, yellowish red, and very pale brown saprolite that crushes to sandy loam

Soil Properties and Qualities

Ashlar

Drainage class: Excessively drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderately rapid
Available water capacity: Low or very low
Tilth: Good
Root zone: Moderately deep

Pacolet

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- Rion and Wedowee soils, which are in landscape positions similar to those of the Ashlar and Pacolet soils
- Soils that are similar to the Ashlar soil and in similar landscape positions but are shallow to bedrock
- Soils that are similar to the Pacolet soil and in similar landscape positions soil but have soft bedrock within a depth of 60 inches

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Poorly suited
Management concerns: Erosion in unprotected or disturbed areas and moderately steep slopes

Woodland

Potential productivity: Moderately high
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected or disturbed areas; moderately steep slopes which limit the use of heavy equipment; windthrow resulting from the depth to hard bedrock
Management measures and considerations:
- Performing planting operations on the contour helps to minimize erosion.
- Slash can be scattered rather than piled and burned.
- Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Slope and depth to bedrock
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited
Limitations: Slope and depth to bedrock
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIe
Woodland ordination symbol: Ashlar—7R; Pacolet—8R

BwB—Buncombe loamy sand, 0 to 6 percent slopes, occasionally flooded

Setting

Landscape position: Natural levees on flood plains
Flooding: Occasional
Slope: Nearly level or gently sloping
Slope topography: Linear to convex

Typical Profile

Surface layer:
0 to 10 inches—dark yellowish brown loamy sand

Underlying material:
10 to 35 inches—yellowish brown sand
35 to 55 inches—yellowish brown sand that has brownish yellow mottles

55 to 60 inches—dark yellowish brown loamy sand that has brownish yellow mottles

Soil Properties and Qualities

Drainage class: Excessively drained
Natural fertility: Low
Organic matter content: Low
Permeability: Rapid
Available water capacity: Low
Tilth: Good
Root zone: Very deep

Inclusions

- A few small areas of Chewacla soils, which are in the lower positions on the flood plain
- A few small areas of Shellbluff soils, which are adjacent to the natural levees
- A few small areas of Toccoa soils, which are in similar landscape positions on the flood plain

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Poorly suited
Management concerns: Flooding and low available water capacity
Management measures and considerations:
- Irrigation can improve the production of pasture and hay crops.

Woodland

Potential productivity: Very high
Preferred trees to plant: Loblolly pine
Management concerns: Seasonal flooding and sandiness which limit the use of heavy equipment; seedling mortality resulting from the droughty nature of the soil
Management measures and considerations:
- Hand planting reduces the need for heavy machinery.

Urban uses

Suitability: Unsuited
Limitations: Flooding; poor filtering capacity which affects septic tank absorption fields

Recreational development

Suitability: Moderately suited
Limitations: Flooding and sandiness

Interpretive Groups

Land capability classification: IVw
Woodland ordination symbol: 9S

CeB—Cecil sandy loam, 2 to 6 percent slopes

Setting

Landscape position: Ridges
Slope: Gently sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 8 inches—brown sandy loam

Subsoil:
8 to 11 inches—reddish brown sandy clay loam
11 to 24 inches—red sandy clay
24 to 37 inches—red sandy clay that has reddish yellow mottles
37 to 48 inches—red sandy clay loam that has reddish yellow mottles

Substratum:
48 to 60 inches—red and reddish yellow saprolite that crushes to sandy clay loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- A few small areas of Appling and Lloyd soils, which are in landscape positions similar to those of the Cecil soil
- A few small areas of Gwinnett and Pacolet soils, which are in the steeper landscape positions
- A few small areas of soils that have an eroded surface layer and are in landscape positions similar to those of the Cecil soil

Use and Management

Land Uses: Mainly pastureland and cropland; some woodland (fig. 2)

Field crops, hay, and pasture

Suitability: Well suited

Figure 2.—A managed pine stand on Cecil sandy loam, 2 to 6 percent slopes. The blackened trunks of pine trees indicate that this site has been control burned to reduce competition from hardwoods. Control burning has the added benefit of providing younger, more succulent vegetation to wildlife.

Management concerns: Erosion in unprotected areas
Management measures and considerations:
• A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Well suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.

Recreational development

Suitability: Well suited
Limitations: No significant limitations

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 8A

CeC—Cecil sandy loam, 6 to 10 percent slopes

Setting

Landscape position: Ridges and hillsides
Slope: Sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 8 inches—brown sandy loam

Subsoil:
8 to 11 inches—reddish brown sandy clay loam
11 to 24 inches—red sandy clay
24 to 37 inches—red sandy clay that has reddish yellow mottles
37 to 48 inches—red sandy clay loam that has reddish yellow mottles

Substratum:
48 to 60 inches—red and reddish yellow saprolite that crushes to sandy clay loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- A few small areas of Appling and Lloyd soils, which are in landscape positions similar to those of the Cecil soil
- A few small areas of Gwinnett and Pacolet soils, which are in the steeper landscape positions
- A few small areas of soils that have an eroded surface layer and are in landscape positions similar to those of the Cecil soil

Use and Management

Land Uses: Mainly pastureland and cropland; some woodland

Field crops, hay, and pasture

Suitability for field crops: Moderately suited
Suitability for hay and pasture: Well suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
- A water management system helps to reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Moderately suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.

Recreational development

Suitability: Moderately suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 8A

CfB2—Cecil sandy clay loam, 2 to 6 percent slopes, eroded

Setting

Landscape position: Ridges
Slope: Gently sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 4 inches—red sandy clay loam

Subsoil:
4 to 26 inches—red clay
26 to 43 inches—red clay that has yellowish brown mottles
43 to 50 inches—red sandy clay loam that has reddish yellow and strong brown mottles

Substratum:
50 to 60 inches—mottled red, strong brown, and reddish yellow loamy saprolite

Soil Properties and Qualities

Drainage class: Well drained

Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Very deep
Other features: An eroded surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Inclusions

- A few small areas of Lloyd soils, which are in landscape positions similar to those of the Cecil soil
- A few small areas of Pacolet soils, which are in the steeper landscape positions

Use and Management

Land Uses: Mainly pastureland and woodland; some cropland

Field crops, hay, and pasture

Suitability: Moderately suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
- A water management system helps to reduce the hazard of erosion.
- Including grasses and legumes in the cropping system helps to prevent further erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Equipment use limitation and seedling mortality resulting from the eroded surface layer
Management measures and considerations:
- Using a chisel or subsoiler helps to increase the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Well suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.

Recreational development

Suitability: Well suited
Limitations: No significant limitations

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 7C

CfC2—Cecil sandy clay loam, 6 to 10 percent slopes, eroded

Setting

Landscape position: Ridges and hillsides
Slope: Sloping
Slope topography: Convex and undulating

Typical Profile

Surface layer:
0 to 4 inches—red sandy clay loam

Subsoil:
4 to 26 inches—red clay
26 to 43 inches—red clay that has yellowish brown mottles
43 to 50 inches—red sandy clay loam that has reddish yellow and strong brown mottles

Substratum:
50 to 60 inches—mottled red, strong brown, and reddish yellow loamy saprolite

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Very deep
Other features: An eroded surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Inclusions

- A few small areas of Lloyd soils, which are in landscape positions similar to those of the Cecil soil
- A few small areas of Pacolet soils, which are in the steeper landscape positions

Use and Management

Land Uses: Mainly pastureland and woodland

Field crops, hay, and pasture

Suitability for field crops: Poorly suited
Suitability for hay and pasture: Moderately suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
• A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
• A water management system helps to reduce the hazard of erosion.
• Including grasses and legumes in the cropping system helps to prevent further erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Equipment use limitation and seedling mortality resulting from the eroded surface layer
Management measures and considerations:
• Performing planting operations on the contour helps to minimize erosion.
• Using a chisel or subsoiler helps to increase the root zone in compacted areas.
• Hand planting reduces the need for heavy machinery.
• Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Moderately suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 7C

ChA—Chewacla silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landscape position: Flood plains
Flooding: Frequent
Slope: Nearly level
Slope topography: Concave to plane

Typical Profile

Surface layer:
0 to 6 inches—brown silt loam

Subsoil:
6 to 20 inches—brown silty clay loam
20 to 32 inches—brown silty clay loam that has grayish brown and pale brown mottles
32 to 38 inches—dark grayish brown sandy clay loam that has strong brown mottles

Substratum:
38 to 44 inches—dark grayish brown sandy clay loam
44 to 52 inches—brown silty clay loam
52 to 58 inches—dark grayish brown loamy sand
58 to 65 inches—dark grayish brown silty clay loam

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Depth to high water table: 0.5 foot to 2.0 feet
Natural fertility: Medium
Organic matter content: Moderate or moderately low
Permeability: Moderate
Available water capacity: High
Tilth: Good
Root zone: Very deep, except from early winter to mid-spring when the water table is at a depth of 0.5 foot to 2.0 feet or when the soil is flooded

Inclusions

• Buncombe soils, which are on the adjacent natural levees
• Roanoke soils, which are in depressions and backswamp areas
• Shellbluff soils, which are in the higher areas of the flood plain along the Ocmulgee River
• A few areas of somewhat poorly drained soils that have coarse-loamy textures and are in landscape positions similar to those of the Chewacla soil

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Poorly suited
Suitability for hay and pasture: Moderately suited
Management concerns: Seasonal wetness and flooding

Woodland

Potential productivity: Very high
Preferred trees to plant: Yellow-poplar and loblolly pine
Management concerns: Seasonal wetness and flooding which limit the use of heavy equipment
Management measures and considerations:
• Harvesting operations should be performed during the drier periods.
• Hand planting reduces the need for heavy machinery.

Urban uses

Suitability: Unsuited
Limitations: Seasonal wetness and flooding

Recreational development

Suitability: Unsuited
Limitations: Seasonal wetness and flooding

Interpretive Groups

Land capability classification: IVw
Woodland ordination symbol: 10W

Cr—Chewacla-Roanoke complex, 0 to 1 percent slopes, ponded

Setting

Landscape position: Chewacla—slightly higher parts of ponded areas on flood plains; Roanoke—depressions and backswamps on flood plains
Landscape features: Areas are ponded primarily by beaver activity; most areas are open or sparsely wooded
Slope: Nearly level
Slope topography: Concave

Composition

Chewacla soil and similar soils: 45 percent
Roanoke soil and similar soils: 30 percent
Dissimilar soils: 25 percent
Pattern of occurrence: Chewacla and Roanoke soils occur in a regular repeating pattern; the proportion of each soil varies from one mapped area to another

Typical Profile

Chewacla

Surface layer:
0 to 6 inches—brown silt loam

Subsoil:
6 to 20 inches—brown silty clay loam that has yellowish brown mottles
20 to 32 inches—brown silty clay loam that has grayish brown and pale brown mottles
32 to 38 inches—dark grayish brown sandy clay loam that has strong brown mottles

Substratum:
38 to 44 inches—dark grayish brown sandy clay loam
44 to 52 inches—brown silty clay loam
52 to 58 inches—dark grayish brown loamy sand
58 to 65 inches—dark grayish brown silty clay loam

Roanoke

Surface layer:
0 to 8 inches—light brownish gray silt loam

Subsoil:
8 to 42 inches—dark grayish brown silty clay
42 to 60 inches—dark grayish brown silty clay loam

Soil Properties and Qualities

Chewacla

Drainage class: Somewhat poorly drained
High water table: 1 foot above the surface to 3 feet below
Natural fertility: Medium
Organic matter content: Moderate or moderately low
Permeability: Moderate
Available water capacity: High
Root zone: Limited most of the year due to ponding

Roanoke

Drainage class: Poorly drained
High water table: 3 feet to 0 feet above the surface
Natural fertility: Low
Organic matter content: Moderately low or moderate
Permeability: Slow
Available water capacity: Moderate
Root zone: Limited most of the year due to ponding

Inclusions

• A few areas of Toccoa soils, which are on the highest parts of the landscape
• A few areas of soils that are similar to the Chewacla soil but have a higher content of clay

Figure 3.—Dying hardwood trees and emergent wetland vegetation in an area of Chewacla-Roanoke complex, 0 to 1 percent slopes, ponded. Most areas of this map unit are in a state of change. They become ponded primarily by beavers, subject to siltation, and deserted.

• A few areas of soils that are gray and loamy throughout

Use and Management

Land Uses: Mostly wetland wildlife (fig. 3); a few areas of woodland

Field crops, hay, and pasture

Suitability: Unsuited
Management concerns: Seasonal flooding and ponding

Woodland

Potential productivity: High
Preferred trees to plant: Water tupelo and blackgum
Management concerns: Seasonal flooding and ponding which limit the use of heavy equipment; seedling mortality caused by seasonal flooding and ponding

Urban uses

Suitability: Unsuited
Limitations: Seasonal flooding and ponding

Recreational development

Suitability: Unsuited
Limitations: Seasonal flooding and ponding

Interpretive Groups

Land capability classification: VIIw
Woodland ordination symbol: Chewacla—6W; Roanoke—8W

GeD—Gwinnett sandy loam, 6 to 15 percent slopes

Setting

Landscape position: Hillsides
Slope: Sloping or strongly sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 5 inches—dark reddish brown sandy loam

Subsoil:
5 to 39 inches—dark red sandy clay

Substratum:
39 to 53 inches—dark red sandy clay loam that has yellowish red mottles
53 to 60 inches—highly weathered hornblende gneiss

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Deep

Inclusions

- A few small areas of Lloyd soils, which are in the smoother landscape positions
- A few small areas of Pacolet soils, which are in landscape positions similar to those of the Gwinnett soil
- A few small areas of soils that have an eroded surface layer and are in landscape positions similar to those of the Gwinnett soil
- A few areas of soils that are in landscape positions similar to those of the Gwinnett soil but do not have soft bedrock within a depth of 60 inches
- A few areas of alluvial soils that are on the lower part of the landscape

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability for field crops: Poorly suited
Suitability for hay and pasture: Moderately suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
- A water management system helps to reduce the hazard of erosion.
- Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Moderately suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 8A

GeE—Gwinnett sandy loam, 15 to 25 percent slopes

Setting

Landscape position: Hillsides
Slope: Moderately steep
Slope topography: Convex

Typical Profile

Surface layer:
0 to 5 inches—dark reddish brown sandy loam

Subsoil:
5 to 39 inches—dark red sandy clay

Substratum:
39 to 53 inches—dark red sandy clay loam that has yellowish red mottles
53 to 60 inches—highly weathered hornblende gneiss

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Deep

Inclusions

- A few small areas of Lloyd soils, which are in the smoother landscape positions
- A few small areas of Pacolet soils, which are in landscape positions similar to those of the Gwinnett soil
- A few small areas of soils that have an eroded surface layer and are in landscape positions similar to those of the Gwinnett soil
- A few areas of soils that are similar to the Gwinnett soil but do not have soft bedrock within a depth of 60 inches
- A few areas of alluvial soils that are on the lower part of the landscape

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Moderately suited
Management concerns: Erosion in unprotected areas and moderately steep slopes
Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; moderately steep slopes which limit the use of heavy equipment
Management measures and considerations:
- Performing planting operations on the contour helps to minimize erosion.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIe
Woodland ordination symbol: 8R

GwD2—Gwinnett sandy clay loam, 6 to 15 percent slopes, eroded

Setting

Landscape position: Hillsides
Slope: Sloping or strongly sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 5 inches—dark reddish brown sandy clay loam

Subsoil:
5 to 15 inches—dark red sandy clay
15 to 37 inches—dark red clay that has yellowish red mottles

Substratum:
37 to 52 inches—dark red sandy clay loam that has reddish yellow mottles
52 to 60 inches—highly weathered hornblende gneiss

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Deep
Other features: An eroded surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Inclusions

- A few small areas of Lloyd soils, which are in the smoother landscape positions
- A few small areas of Pacolet soils, which are in landscape positions similar to those of the Gwinnett soil
- A few areas of soils that are in landscape positions similar to those of the Gwinnett soil but do not have soft bedrock within a depth of 60 inches
- A few areas of alluvial soils that are on the lower part of the landscape

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability for field crops: Poorly suited or unsuited
Suitability for hay and pasture: Moderately suited
Management concerns: Erosion in unprotected areas and slope
Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; equipment use limitation and seedling mortality resulting from the eroded surface layer
Management measures and considerations:
- Performing planting operations on the contour helps to minimize erosion.
- Using a chisel or subsoiler helps to increase the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Moderately suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIe
Woodland ordination symbol: 7C

GwE2—Gwinnett sandy clay loam, 15 to 25 percent slopes, eroded

Setting

Landscape position: Hillsides
Slope: Moderately steep
Slope topography: Convex

Typical Profile

Surface layer:
0 to 5 inches—dark reddish brown sandy clay loam

Subsoil:
5 to 15 inches—dark red sandy clay
15 to 37 inches—dark red clay that has yellowish red mottles

Substratum:
37 to 52 inches—dark red sandy clay loam that has reddish yellow mottles
52 to 60 inches—highly weathered hornblende gneiss

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Deep
Other features: An eroded surface layer that is a

mixture of the original surface soil and the upper part of the subsoil

Inclusions

- A few small areas of Lloyd soils, which are in the smoother landscape positions
- A few small areas of Pacolet soils, which are in landscape positions similar to those of the Gwinnett soil
- A few areas of soils that are in landscape positions similar to those of the Gwinnett soil but do not have soft bedrock within a depth of 60 inches
- A few areas of alluvial soils that are on the lower part of the landscape

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Poorly suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: Moderately high
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; moderately steep slopes which limit the use of heavy equipment; equipment use limitation and seedling mortality resulting from the eroded surface layer
Management measures and considerations:
- Performing planting operations on the contour helps to minimize erosion.
- Using a chisel or subsoiler helps to increase the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIe
Woodland ordination symbol: 4R

IrB—Iredell fine sandy loam, 0 to 6 percent slopes

Setting

Landscape position: Upland flats
Slope: Nearly level or gently sloping
Slope topography: Linear

Typical Profile

Surface layer:
0 to 5 inches—brown fine sandy loam

Subsoil:
5 to 24 inches—dark yellowish brown clay

Substratum:
24 to 40 inches—mottled yellowish brown, yellow, and dark gray saprolite that crushes to sandy clay loam
40 to 60 inches—mottled very pale brown, light brownish gray, and gray saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Moderately well drained
Depth to high water table: 1.0 to 2.0 feet (perched)
Natural fertility: Medium
Organic matter content: Low or moderately low
Permeability: Slow
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- A few areas of Mecklenburg soils, which are on outlying parts of mapped areas and in the more sloping areas
- A few areas of poorly drained soils that are in low or depressional areas

Figure 4.—Hardwood trees on Iredell fine sandy loam, 0 to 6 percent slopes. Iredell soils typically occur in areas of smooth topography.

• A few areas of soils that are in landscape positions similar to those of the Iredell soil and that formed in residuum from a mixture of felsic, intermediate, and basic rock

Use and Management

Land Uses: Mainly woodland (fig. 4)

Field crops, hay, and pasture

Suitability for field crops: Moderately suited
Suitability for hay and pasture: Well suited
Management concerns: Seasonal wetness
Management measures and considerations:
• A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine and white oak
Management concerns: Seasonal wetness which

limits the use of heavy equipment; seedling mortality
Management measures and considerations:
• Harvesting operations should be performed during the drier periods.
• Hand planting reduces the need for heavy machinery.

Urban uses

Suitability: Poorly suited
Limitations: Slow permeability in the subsoil which severely affects septic tank absorption fields; a high shrink-swell potential and seasonal wetness which severely limit building site development
Management measures and considerations:
• Special design and installation of building foundations may help to reduce the soil limitations.

Recreational development

Suitability: Poorly suited
Limitations: Seasonal wetness

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 6C

IrC—Iredell fine sandy loam, 6 to 10 percent slopes

Setting

Landscape position: Hillsides
Slope: Sloping
Slope topography: Slightly convex

Typical Profile

Surface layer:
0 to 5 inches—brown fine sandy loam

Subsoil:
5 to 24 inches—dark yellowish brown clay

Substratum:
24 to 40 inches—mottled yellowish brown, yellow, and dark gray saprolite that crushes to sandy clay loam
40 to 60 inches—mottled very pale brown, light brownish gray, and gray saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Moderately well drained
Depth to high water table: 1.0 to 2.0 feet (perched)
Natural fertility: Medium
Organic matter content: Low or moderately low
Permeability: Slow
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

• A few areas of Mecklenburg soils, which are in landscape positions similar to those of the Iredell soil
• A few areas of Wilkes and Zion soils, which are in the steeper landscape positions
• A few areas of poorly drained soils that are in low or depressional areas
• A few areas of soils that are in landscape positions similar to those of the Iredell soil and that formed in residuum from a mixture of felsic, intermediate, and basic rock

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability: Moderately suited
Management concerns: Seasonal wetness; erosion in unprotected areas
Management measures and considerations:
• A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine and white oak
Management concerns: Seasonal wetness which limits the use of heavy equipment; seedling mortality
Management measures and considerations:
• Harvesting operations should be performed during the drier periods.
• Hand planting reduces the need for heavy machinery.

Urban uses

Suitability: Poorly suited
Limitations: Slow permeability in the subsoil which severely affects septic tank absorption fields; a high shrink-swell potential and seasonal wetness which severely limit building site development
Management measures and considerations:
• Special design and installation of building foundations may help to reduce the soil limitations.

Recreational development

Suitability: Poorly suited

Limitations: Seasonal wetness; slope; erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 6C

LdB—Lloyd loam, 2 to 6 percent slopes

Setting

Landscape position: Ridges
Slope: Gently sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 9 inches—dark reddish brown loam

Subsoil:
9 to 17 inches—dark red clay loam
17 to 33 inches—dark red clay
33 to 46 inches—red clay
46 to 56 inches—red clay loam

Substratum:
56 to 60 inches—red saprolite that crushes to loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

• A few areas of Cecil soils, which are in landscape positions similar to those of the Lloyd soil
• A few small areas of Gwinnett and Pacolet soils, which are in the steeper landscape positions
• Some areas of soils that have a solum that is thicker than that of the Lloyd soil
• A few areas of soils that have an eroded surface layer and that are in landscape positions similar to those of the Lloyd soil

Use and Management

Land Uses: Mainly pastureland and woodland (fig. 5); some cropland

Field crops, hay, and pasture

Suitability: Well suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
• A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Well suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.

Recreational development

Suitability: Well suited
Limitations: No significant limitations

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 8A

LdC—Lloyd loam, 6 to 10 percent slopes

Setting

Landscape position: Ridges and hillsides
Slope: Sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 9 inches—dark reddish brown loam

Subsoil:
9 to 17 inches—dark red clay loam
17 to 33 inches—dark red clay
33 to 46 inches—red clay
46 to 56 inches—red clay loam

Substratum:
56 to 60 inches—red saprolite that crushes to loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low

Figure 5.—Hayfield in an area of Lloyd loam, 2 to 6 percent slopes. This soil is very productive and responds well to applications of lime and fertilizer.

Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- A few small areas of Gwinnett and Pacolet soils, which are in the steeper landscape positions
- A few areas of soils that have a solum that is thicker than that of the Lloyd soil
- A few areas of soils that have a surface layer of clay loam

Use and Management

Land Uses: Mainly pastureland and woodland; some cropland

Field crops, hay, and pasture

Suitability for field crops: Moderately suited
Suitability for hay and pasture: Well suited
Management concerns: Erosion in unprotected or disturbed areas
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain good tilth, and reduce the hazard of erosion.

• A water management system helps to reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Well suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 8A

LfB2—Lloyd clay loam, 2 to 6 percent slopes, eroded

Setting

Landscape position: Ridges
Slope: Gently sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 6 inches—dark reddish brown clay loam

Subsoil:
6 to 34 inches—dark red clay
34 to 48 inches—red clay loam

Substratum:
48 to 60 inches—yellowish red and brownish yellow saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Very deep
Other features: An eroded surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Inclusions

• A few small areas of Cecil soils, which are in landscape positions similar to those of the Lloyd soil
• A few small areas of Gwinnett and Pacolet soils, which are on the steeper parts of the landscape
• A few areas of soils that have a solum that is thicker than that of the Lloyd soil

Use and Management

Land Uses: Mainly pastureland and woodland; some cropland

Field crops, hay, and pasture

Suitability: Moderately suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
• A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
• A water management system helps to reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Equipment use limitation and seedling mortality resulting from the eroded surface layer
Management measures and considerations:
• Using a chisel or subsoiler helps to increase the root zone in compacted areas.
• Hand planting reduces the need for heavy machinery.
• Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Well suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields
Management measures and considerations:
• Special design and proper application of septic systems helps to reduce the soil limitations.

Recreational development

Suitability: Well suited
Limitations: No significant limitations

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 7C

LfD2—Lloyd clay loam, 6 to 15 percent slopes, eroded

Setting

Landscape position: Narrow ridges and hillsides
Slope: Sloping or strongly sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 6 inches—dark reddish brown clay loam

Subsoil:
6 to 34 inches—dark red clay
34 to 48 inches—red clay loam

Substratum:
48 to 60 inches—yellowish red and brownish yellow saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Very deep
Other features: An eroded surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Inclusions

- A few small areas of Gwinnett and Pacolet soils, which are in the steeper landscape positions
- A few small areas of soils that have a loam surface layer and that are in landscape positions similar to those of the Lloyd soil
- A few areas of soils that have a solum that is thicker than that of the Lloyd soil
- A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability for field crops: Poorly suited
Suitability for hay and pasture: Moderately suited
Management concerns: Erosion in unprotected areas and slope
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
- A water management system helps to reduce the hazard of erosion.
- Including grasses and legumes in the cropping system helps to prevent further erosion.
- Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Equipment use limitation and seedling mortality resulting from the eroded surface layer
Management measures and considerations:
- Performing planting operations on the contour helps to minimize erosion.
- Using a chisel or subsoiler helps to increase the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Moderately suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope
Management measures and considerations:
- Special design and proper application of septic systems helps to reduce the soil limitations.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 7C

LfE2—Lloyd clay loam, 15 to 30 percent slopes, eroded

Setting

Landscape position: Hillsides
Slope: Moderately steep or steep
Slope topography: Convex

Typical Profile

Surface layer:
0 to 6 inches—dark reddish brown clay loam

Subsoil:
6 to 34 inches—dark red clay
34 to 48 inches—red clay loam

Substratum:
48 to 60 inches—yellowish red and brownish yellow material that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Very deep
Other features: An eroded surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Inclusions

• A few small areas of Gwinnett soils, which are in landscape positions similar to those of the Lloyd soil
• A few small areas of soils that have a loam surface layer and that are in landscape positions similar to those of the Lloyd soil
• A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Poorly suited
Management concerns: Erosion in unprotected areas and moderately steep or steep slopes
Management measures and considerations:
• Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; equipment use limitation and seedling mortality resulting from the eroded surface layer; moderately steep and steep slopes which limit the use of heavy equipment
Management measures and considerations:
• Performing planting operations on the contour helps to minimize erosion.
• Using a chisel or subsoiler helps to increase the root zone in compacted areas.
• Hand planting reduces the need for heavy machinery.
• Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIIe
Woodland ordination symbol: 7R

LuC—Lloyd-Urban land complex, 2 to 10 percent slopes

Setting

Landscape position: Ridges and hillsides
Slope: Gently sloping or sloping
Slope topography: Convex

Composition

Lloyd soil and similar soils: 50 percent

Urban land: 25 percent
Dissimilar soils: 25 percent

Typical Profile

Lloyd

Surface layer:
0 to 9 inches—dark reddish brown loam

Subsoil:
9 to 17 inches—dark red clay loam
17 to 33 inches—dark red clay
33 to 46 inches—red clay
46 to 56 inches—red clay loam

Substratum:
56 to 60 inches—red saprolite that crushes to loam

Urban land

Urban land consists of areas that have been altered by cutting, filling, and shaping. Schools, parking lots, streets, commercial buildings, and residential dwellings are located in these areas.

Soil Properties and Qualities of the Lloyd Soil

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- A few areas of Cecil soils, which are in landscape positions similar to those of the Lloyd soil
- A few areas of Gwinnett and Pacolet soils, which are in the steeper landscape positions
- A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Urban uses

Suitability: Well suited
Limitations: Moderate permeability in the subsoil of the Lloyd soil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: None assigned
Woodland ordination symbol: None assigned

MaD—Madison sandy loam, 6 to 15 percent slopes

Setting

Landscape position: Hillsides
Slope: Sloping or strongly sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 10 inches—yellowish red sandy clay
10 to 17 inches—red clay
17 to 24 inches—red sandy clay
24 to 38 inches—red sandy clay loam that has yellow and strong brown mottles

Substratum:
38 to 50 inches—mottled yellowish red, reddish yellow, and brown saprolite that crushes to sandy clay loam
50 to 60 inches—mottled brown, reddish yellow, and yellowish red saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep
Distinctive features: Common or many flakes of mica in the upper part of the profile and many flakes of mica in the lower part of the solum

Inclusions

- Pacolet soils, which are in landscape positions similar to those of the Madison soil

• Wilkes soils, which are on the adjoining ridges and hillsides
• Zion soils, which are on the adjoining hillsides
• A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability for field crops: Moderately suited or poorly suited
Suitability for hay and pasture: Well suited or moderately suited
Management concerns: Erosion in unprotected areas and slope
Management measures and considerations:
• A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
• A water management system helps to reduce the hazard of erosion.
• Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Moderately suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Slope
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 7A

MaE—Madison sandy loam, 15 to 30 percent slopes

Setting

Landscape position: Hillsides
Slope: Moderately steep or steep
Slope topography: Convex

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 10 inches—yellowish red sandy clay
10 to 17 inches—red clay
17 to 24 inches—red sandy clay
24 to 38 inches—red sandy clay loam that has yellow and strong brown mottles

Substratum:
38 to 50 inches—mottled yellowish red, reddish yellow, and brown saprolite that crushes to sandy clay loam
50 to 60 inches—mottled brown, reddish yellow, and yellowish red saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep
Distinctive features: Common or many flakes of mica in the upper part of the profile and many flakes of mica in the lower part of the solum

Inclusions

• Pacolet soils, which are in landscape positions similar to those of the Madison soil
• Wilkes soils, which are on the adjoining ridges and hillsides
• Wynott and Zion soils, which are on the adjoining hillsides

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Moderately suited

Management concerns: Erosion in unprotected areas and moderately steep or steep slopes
Management measures and considerations:
• Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; moderately steep and steep slopes which limit the use of heavy equipment
Management measures and considerations:
• Performing planting operations on the contour helps to minimize erosion.
• Hand planting reduces the need for heavy machinery.
• Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Slope; moderate permeability in the subsoil which affects septic tank absorption fields
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIIe
Woodland ordination symbol: 7R

MdD2—Madison sandy clay loam, 6 to 15 percent slopes, eroded

Setting

Landscape position: Hillsides
Slope: Sloping or strongly sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 4 inches—brown sandy clay loam

Subsoil:
4 to 18 inches—red sandy clay
18 to 27 inches—mottled red, yellowish red, and reddish yellow sandy clay

Substratum:
27 to 60 inches—yellowish red sandy clay loam that has red and reddish yellow mottles

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Very deep
Distinctive features: Common or many flakes of mica in the upper part of the profile and many flakes of mica in the lower part of the solum
Other features: An eroded surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Inclusions

• Pacolet soils, which are in landscape positions similar to those of the Madison soil
• Wilkes and Zion soils, which are in the adjoining, steeper landscape positions
• A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability for field crops: Poorly suited or unsuited
Suitability for hay and pasture: Moderately suited
Management concerns: Erosion in unprotected areas and slope
Management measures and considerations:
• Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Equipment use limitation and seedling mortality resulting from the eroded surface layer
Management measures and considerations:
• Performing planting operations on the contour helps to minimize erosion.

• Using a chisel or subsoiler helps to increase the root zone in compacted areas.
• Hand planting reduces the need for heavy machinery.
• Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Moderately suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Slope
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIe
Woodland ordination symbol: 6C

MdE2—Madison sandy clay loam, 15 to 30 percent slopes, eroded

Setting

Landscape position: Hillsides
Slope: Moderately steep or steep
Slope topography: Convex

Typical Profile

Surface layer:
0 to 4 inches—brown sandy clay loam

Subsoil:
4 to 18 inches—red sandy clay
18 to 27 inches—mottled red, yellowish red, and reddish yellow sandy clay

Substratum:
27 to 60 inches—yellowish red sandy clay loam that has red and reddish yellow mottles

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Very deep
Distinctive features: Common or many flakes of mica in the upper part of the profile and many flakes of mica in the lower part of the solum
Other features: An eroded surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Inclusions

• Pacolet, Wilkes, Wynott, and Zion soils, which are in landscape positions similar to those of the Madison soil
• A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Poorly suited
Management concerns: Erosion in unprotected areas and moderately steep and steep slopes
Management measures and considerations:
• Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; moderately steep and steep slopes which limit the use of heavy equipment; seedling mortality
Management measures and considerations:
• Performing planting operations on the contour helps to minimize erosion.
• Using a chisel or subsoiler helps to increase the root zone in compacted areas.
• Hand planting reduces the need for heavy machinery.
• Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Slope; moderate permeability in the subsoil which affects septic tank absorption fields; erosion in unprotected areas

Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIIe
Woodland ordination symbol: 6R

MeB—Mecklenburg loam, 2 to 6 percent slopes

Setting

Landscape position: Ridges
Slope: Gently sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 8 inches—dark brown loam

Subsoil:
8 to 15 inches—reddish brown clay
15 to 26 inches—yellowish red clay that has brownish yellow mottles
26 to 33 inches—brown clay loam that has yellowish red and yellow mottles

Substratum:
33 to 42 inches—mottled yellowish red, light olive brown, and yellow saprolite that crushes to clay loam
42 to 60 inches—light olive brown saprolite that crushes to clay loam and has very pale brown and yellowish red mottles

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Medium
Organic matter content: Low or moderately low
Permeability: Slow
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

• Iredell soils, which are in the smoother landscape positions
• Lloyd soils, which are in the steeper landscape positions

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability: Well suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
• A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine and shortleaf pine
Management concerns: No significant limitations

Urban uses

Suitability: Moderately suited or poorly suited
Limitations: Slow permeability in the subsoil which severely affects septic tank absorption fields; the shrink-swell potential which limits building site development
Management measures and considerations:
• Special design and installation of building foundations may help to reduce the soil limitations.

Recreational development

Suitability: Moderately suited
Limitations: Slow permeability

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 7A

MeC—Mecklenburg sandy loam, 6 to 10 percent slopes

Setting

Landscape position: Hillsides
Slope: Sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 8 inches—dark brown loam

Subsoil:
8 to 15 inches—reddish brown clay
15 to 26 inches—yellowish red clay that has brownish yellow mottles
26 to 33 inches—brown clay loam that has yellowish red and yellow mottles

Substratum:
33 to 42 inches—mottled yellowish red, light olive brown, and yellow saprolite that crushes to clay loam
42 to 60 inches—light olive brown saprolite that crushes to clay loam and has very pale brown and yellowish red mottles

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Medium
Organic matter content: Low or moderately low
Permeability: Slow
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- Iredell soils, which are in the smoother landscape positions
- Lloyd and Zion soils, which are in the steeper landscape positions
- A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability for field crops: Moderately suited
Suitability for hay and pasture: Well suited
Management concerns: Erosion in unprotected areas and slope
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
- A water management system helps to reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine and shortleaf pine
Management concerns: No significant limitations

Urban uses

Suitability: Moderately suited or poorly suited
Limitations: Slow permeability in the subsoil which severely affects septic tank absorption fields; the shrink-swell potential which limits building site development
Management measures and considerations:
- Special design and installation of building foundations may help to reduce the soil limitations.

Recreational development

Suitability: Moderately suited
Limitations: Slow permeability

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 7A

MoC—Molena loamy sand, 2 to 10 percent slopes

Setting

Landscape position: Stream terraces
Slope: Gently sloping or sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 10 inches—dark brown loamy sand

Subsoil:
10 to 25 inches—dark brown loamy sand
25 to 42 inches—brown loamy sand

Substratum:
42 to 56 inches—strong brown sand
56 to 60 inches—yellowish red sand

Soil Properties and Qualities

Drainage class: Somewhat excessively drained
Natural fertility: Low
Organic matter content: Low
Permeability: Rapid
Available water capacity: Low
Tilth: Good
Root zone: Very deep

Inclusions

- A few small areas of Wickham soils, which are on stream terraces
- A few small areas of Red Bay soils, which are in the adjacent, higher landscape positions

• A few small areas of soils that are similar to the Molena soil and in similar landscape positions but that have a dark red subsoil

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Poorly suited
Suitability for hay and pasture: Moderately suited
Management concerns: Low available water capacity; erosion in unprotected areas
Management measures and considerations:
• A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
• Returning crop residue to the soil helps to retain soil moisture.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Equipment use limitation and seedling mortality resulting from the sandiness of the soil
Management measures and considerations:
• Slash can be scattered rather than piled and burned.

Urban uses

Suitability: Moderately suited
Limitations: Poor filtering capacity which affects septic tank absorption fields

Recreational development

Suitability: Moderately suited
Limitations: Slope and sandiness

Interpretive Groups

Land capability classification: IVs
Woodland ordination symbol: 8S

PaB—Pacolet sandy loam, 2 to 6 percent slopes

Setting

Landscape position: Ridges
Slope: Gently sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—mottled red, yellowish red, and pink saprolite that crushes to sandy clay loam
54 to 60 inches—mottled red, yellowish red, and very pale brown saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

• A few small areas of Ashlar soils, which are near areas of rock outcrop
• A few small areas of Cecil soils, which are in the smoother landscape positions
• A few small areas of Gwinnett soils, which are in landscape positions similar to those of the Pacolet soil

Use and Management

Land Uses: Cropland, pastureland, and woodland

Field crops, hay, and pasture

Suitability: Well suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
• A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Well suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.

Recreational development

Suitability: Well suited
Limitations: No significant limitations

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 8A

PaD—Pacolet sandy loam, 6 to 15 percent slopes

Setting

Landscape position: Ridges and hillsides
Slope: Sloping or strongly sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—mottled red, yellowish red, and pink saprolite that crushes to sandy clay loam
54 to 60 inches—mottled red, yellowish red, and very pale brown saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- A few small areas of Ashlar soils, which are near areas of rock outcrop
- A few small areas of Cecil soils, which are in the smoother landscape positions
- A few small areas of Gwinnett soils, which are in landscape positions similar to those of the Pacolet soil
- A few small areas of Rion soils, which are in the steeper landscape positions
- A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Land Uses: Mainly woodland; some cropland and pastureland

Field crops, hay, and pasture

Suitability for field crops: Moderately suited or poorly suited
Suitability for hay and pasture: Well suited or moderately suited
Management concerns: Erosion in unprotected areas and slope
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
- A water management system helps to reduce runoff and control erosion.
- Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Moderately suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Slope
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 8A

PaE—Pacolet sandy loam, 15 to 25 percent slopes

Setting

Landscape position: Hillsides

Slope: Moderately steep
Slope topography: Convex

Typical Profile

Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—mottled red, yellowish red, and pink saprolite that crushes to sandy clay loam
54 to 60 inches—mottled red, yellowish red, and very pale brown saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- A few small areas of Ashlar soils, which are near areas of rock outcrop
- A few small areas of Gwinnett and Wedowee soils, which are in landscape positions similar to those of the Pacolet soil
- A few small areas of Rion soils, which are in the steeper landscape positions
- A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Moderately suited
Management concerns: Erosion in unprotected areas and moderately steep slopes
Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; moderately steep slopes which limit the use of heavy equipment
Management measures and considerations:
- Performing planting operations on the contour helps to minimize erosion.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIe
Woodland ordination symbol: 8R

PfB2—Pacolet sandy clay loam, 2 to 6 percent slopes, eroded

Setting

Landscape position: Ridges
Slope: Gently sloping
Slope topography: Convex and undulating

Typical Profile

Surface layer:
0 to 6 inches—yellowish red sandy clay loam

Subsoil:
6 to 18 inches—red sandy clay
18 to 24 inches—red sandy clay that has strong brown mottles

Substratum:
24 to 60 inches—reddish brown and white saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Low
Tilth: Poor
Root zone: Very deep
Other features: An eroded surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Inclusions

- A few small areas of Ashlar soils, which are near areas of rock outcrop
- A few small areas of Cecil soils, which are in the smoother landscape positions
- A few small areas of Gwinnett and Madison soils, which are in landscape positions similar to those of the Pacolet soil

Use and Management

Land Uses: Mainly woodland and pastureland; some cropland

Field crops, hay, and pasture

Suitability: Moderately suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
- A water management system helps to reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Equipment use limitation and seedling mortality resulting from the eroded surface layer
Management measures and considerations:
- Using a chisel or subsoiler helps to increase the root zone in compacted areas.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Well suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.

Recreational development

Suitability: Well suited
Limitations: No significant limitations

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 6C

PfD2—Pacolet sandy clay loam, 6 to 15 percent slopes, eroded

Setting

Landscape position: Hillsides
Slope: Sloping or strongly sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 6 inches—yellowish red sandy clay loam

Subsoil:
6 to 18 inches—red sandy clay
18 to 24 inches—red sandy clay loam that has strong brown mottles

Substratum:
24 to 60 inches—reddish brown and white saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Very deep
Other features: An eroded surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Inclusions

- A few small areas of Ashlar soils, which are near areas of granite outcrop
- A few small areas of Gwinnett soils, which are in landscape positions similar to those of the Pacolet soil

• A few small areas of Rion soils, which are in the steeper landscape positions
• A few areas of alluvial soils, which are in the lower landscape positions

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability for field crops: Poorly suited or unsuited
Suitability for hay and pasture: Moderately suited
Management concerns: Erosion in unprotected areas and slope
Management measures and considerations:
• Including grasses and legumes in the cropping system helps to prevent further erosion.
• Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; equipment use limitation and seedling mortality resulting from the eroded surface layer
Management measures and considerations:
• Performing planting operations on the contour helps to minimize erosion.
• Using a chisel or subsoiler helps to increase the root zone in compacted areas.
• Hand planting reduces the need for heavy machinery.
• Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Moderately suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIe
Woodland ordination symbol: 6C

PfE2—Pacolet sandy clay loam, 15 to 25 percent slopes, eroded

Setting

Landscape position: Hillsides
Slope: Moderately steep
Slope topography: Convex

Typical Profile

Surface layer:
0 to 6 inches—yellowish red sandy clay loam

Subsoil:
6 to 18 inches—red sandy clay
18 to 24 inches—red sandy clay loam that has strong brown mottles

Substratum:
24 to 60 inches—reddish brown and white saprolite that crushes to sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Very deep
Other features: An eroded surface layer that is a mixture of the original surface soil and the upper part of the subsoil

Inclusions

• A few small areas of Ashlar soils, which are near areas of granite outcrop
• A few small areas of Gwinnett soils, which are in landscape positions similar to those of the Pacolet soil
• A few small areas of Rion soils, which are in the steeper landscape positions
• A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Land Uses: Mainly woodland; some pastureland

Field crops, hay, and pasture

Suitability for field crops: Unsuited

Suitability for hay and pasture: Poorly suited
Management concerns: Erosion in unprotected areas and moderately steep slopes
Management measures and considerations:
• Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; moderately steep slopes which limit the use of heavy equipment; seedling mortality
Management measures and considerations:
• Performing planting operations on the contour helps to minimize erosion.
• Using a chisel or subsoiler helps to increase the root zone in compacted areas.
• Hand planting reduces the need for heavy machinery.
• Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIIe
Woodland ordination symbol: 6R

PgE—Pacolet-Urban land complex, 10 to 25 percent slopes

Setting

Landscape position: Hillsides
Slope: Strongly sloping or moderately steep
Slope topography: Convex

Composition

Pacolet soil and similar soils: 50 percent
Urban land: 25 percent
Dissimilar soils: 25 percent

Typical Profile

Pacolet

Surface layer:
0 to 7 inches—dark yellowish brown sandy loam

Subsoil:
7 to 20 inches—red sandy clay
20 to 25 inches—red sandy clay that has reddish yellow mottles
25 to 33 inches—red sandy clay loam that has yellowish red and pink mottles

Substratum:
33 to 54 inches—mottled red, yellowish red, and pink sandy clay loam
54 to 60 inches—mottled red, strong brown, and very pale brown sandy loam

Urban land

Urban land consists of areas that have been altered by cutting, filling, and shaping. Schools, parking lots, streets, commercial buildings, and residential dwellings are located in these areas.

Soil Properties and Qualities of the Pacolet Soil

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

• A few areas of Ashlar soils, which are in stony areas or near areas of rock outcrop
• A few areas of Gwinnett and Wedowee soils, which are in landscape positions similar to those of the Pacolet soil
• A few areas of Rion soils, which are in the steeper landscape positions
• A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Urban uses

Suitability: Poorly suited

Limitations: Slope; moderate permeability in the subsoil of the Pacolet soil which affects septic tank absorption fields; erosion in unprotected areas
Management measures and considerations:
• Special design and application of septic systems helps to reduce the soil limitations.
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: None assigned
Woodland ordination symbol: None assigned

Pt—Pits, quarry

Setting

Landscape position: Ridges and hillsides

Typical Profile

This map unit consists of open pits and quarries ranging from 5 to 50 feet in depth. In most cases the areas have been mined for sand or feldspar, but a few areas have been mined for crushed rock. Soil overburden has been stripped and has been piled to the side in most areas. Small, isolated areas of natural soil may remain undisturbed in a few mined areas. Some feldspar quarries have filled with water, creating small lakes (fig. 6). A typical profile is not given due to the variability of the soil material.

Use and Management

Land Uses: Mainly idle land; a few areas of woodland

This map unit is unsuited to field crops, hay, and pasture; urban uses; and recreational development. It has low potential productivity for woodland.

Interpretive Groups

Land capability classification: None assigned
Woodland ordination symbol: None assigned

RbB—Red Bay sandy loam, 2 to 5 percent slopes

Setting

Landscape position: High stream terraces
Slope: Gently sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 8 inches—dusky red sandy loam

Subsoil:
8 to 22 inches—dark reddish brown sandy clay loam that has very dusky red streaks
22 to 44 inches—dark reddish brown sandy clay loam
44 to 62 inches—dark red sandy clay loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

• A few areas of Molena soils, which are in landscape positions similar to those of the Red Bay soil
• A few areas of Lloyd soils, which are on adjacent hillsides
• A few areas of soils that have a red subsoil and a solum that is 40 to 60 inches deep

Use and Management

Land Uses: Woodland

Field crops, hay, and pasture

Suitability: Well suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
• A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.

Woodland

Potential productivity: Very high
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Well suited
Limitations: No significant limitations

Recreational development

Suitability: Well suited
Limitations: No significant limitations

Figure 6.—A small lake and mine spoil in an area of Pits, quarry. This area was mined for feldspar.

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 9A

RbC—Red Bay sandy loam, 5 to 12 percent slopes

Setting

Landscape position: High stream terraces
Slope: Sloping or strongly sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 8 inches—dusky red sandy loam

Subsoil:
8 to 22 inches—dark reddish brown sandy clay loam that has very dusky red streaks
22 to 44 inches—dark reddish brown sandy clay loam
44 to 62 inches—dark red sandy clay loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low

Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- A few areas of Molena soils, which are in the smoother landscape positions
- A few areas of Lloyd soils, which are on adjacent hillsides
- A few areas of soils that have a red subsoil and a solum that is 40 to 60 inches deep

Use and Management

Land Uses: Woodland

Field crops, hay, and pasture

Suitability for field crops: Poorly suited
Suitability for hay and pasture: Moderately suited
Management concerns: Erosion in unprotected areas and slope
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
- A water management system helps to reduce runoff and control erosion.

Woodland

Potential productivity: Very high
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Moderately suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 9A

ReF—Rion sandy loam, 15 to 40 percent slopes

Setting

Landscape position: Hillsides
Slope: Moderately steep or steep
Slope topography: Convex

Typical Profile

Surface layer:
0 to 7 inches—strong brown sandy loam

Subsoil:
7 to 20 inches—yellowish red sandy clay loam
20 to 36 inches—yellowish red sandy clay loam that has strong brown mottles

Substratum:
36 to 60 inches—mottled yellowish red, strong brown, and brownish yellow sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- A few small areas of Ashlar soils, which are near areas of rock outcrop
- A few small areas of Pacolet and Wedowee soils, which are in landscape positions similar to those of the Rion soil
- A few small areas of fine-loamy soils that have rippable bedrock at a depth of less than 60 inches and are in landscape positions similar to those of the Rion soil
- A few areas of alluvial soils that are on the lower part of the landscape

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Poorly suited
Management concerns: Erosion in unprotected areas and moderately steep or steep slopes

Management measures and considerations:
• Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; moderately steep or steep slopes which limit the use of heavy equipment
Management measures and considerations:
• Performing planting operations on the contour helps to minimize erosion.
• Hand planting reduces the need for heavy machinery.
• Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIIe
Woodland ordination symbol: 8R

Rk—Roanoke silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landscape position: Flood plains
Flooding: Frequent
Slope: Nearly level
Slope topography: Concave to linear

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown silt loam

Subsoil:
8 to 42 inches—dark grayish brown silty clay
42 to 60 inches—dark grayish brown silty clay loam

Soil Properties and Qualities

Drainage class: Poorly drained
Depth to high water table: 0 to 1 foot
Natural fertility: Low
Organic matter content: Low or moderately low
Permeability: Slow
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

• Areas of Chewacla, Shellbluff, and Toccoa soils, which are on the higher parts of the flood plain

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Poorly suited
Management concerns: Seasonal wetness and flooding

Woodland

Potential productivity: High
Preferred trees to plant: Willow oak and green ash
Management concerns: Seasonal wetness and flooding which limit the use of heavy equipment
Management measures and considerations:
• Harvesting operations should be performed during the drier periods.
• Hand planting reduces the need for heavy machinery.

Urban uses

Suitability: Unsuited
Limitations: Seasonal wetness and flooding

Recreational development

Suitability: Unsuited
Limitations: Seasonal wetness and flooding

Interpretive Groups

Land capability classification: Vw
Woodland ordination symbol: 7W

Sh—Shellbluff loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landscape position: Flood plains
Flooding: Occasional

Slope: Nearly level or gently sloping
Slope topography: Linear to slightly convex

Typical Profile

Surface layer:
0 to 6 inches—brown loam
6 to 10 inches—brown silt loam

Subsoil:
10 to 16 inches—brown silty clay loam that has few fine manganese concretions
16 to 55 inches—brown silty clay loam
55 to 60 inches—brown silt loam that has light yellowish brown mottles

Soil Properties and Qualities

Drainage class: Well drained
Depth to high water table: 3.0 to 5.0 feet
Natural fertility: Low or medium
Organic matter content: Low to moderate
Permeability: Moderate
Available water capacity: High
Tilth: Good
Root zone: Very deep

Inclusions

- Buncombe soils, which are on the adjacent natural levees
- Chewacla soils, which are on the lower parts of the flood plain
- Roanoke soils, which are in depressions and backswamp areas
- Toccoa soils, which are on the higher parts of the flood plain

Use and Management

Land Uses: Woodland

Field crops, hay, and pasture

Suitability: Well suited
Management concerns: Occasional flooding

Woodland

Potential productivity: Very high
Preferred trees to plant: Loblolly pine and yellow-poplar
Management concerns: No significant limitations

Urban uses

Suitability: Unsuited
Limitations: Occasional flooding

Recreational development

Suitability: Poorly suited
Limitations: Occasional flooding

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: 10A

ToA—Toccoa fine sandy loam, 0 to 3 percent slopes, frequently flooded

Setting

Landscape position: Flood plains
Flooding: Frequent
Slope: Nearly level
Slope topography: Convex to plane

Typical Profile

Surface layer:
0 to 4 inches—brown fine sandy loam

Underlying material:
4 to 22 inches—strong brown sandy loam
22 to 35 inches—yellowish red sandy loam
35 to 43 inches—yellowish red loamy sand
43 to 57 inches—yellowish red sandy loam
57 to 60 inches—mottled strong brown, brown, and dark yellowish brown loam

Soil Properties and Qualities

Drainage class: Moderately well drained or well drained
Depth to high water table: 2.5 to 5.0 feet
Natural fertility: Low
Organic matter content: Moderately low
Permeability: Moderately rapid
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep, except from early winter to mid-spring when the water table is at a depth of 2.5 to 5 feet or when the soil is flooded
Distinctive features: Bedding planes and thin strata of sandy or loamy material occurring throughout the underlying material

Inclusions

- Buncombe soils, which are on the adjacent natural levees
- A few areas of well drained soils that have fine-

loamy textures and are in landscape positions similar to those of the Toccoa soil

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Moderately suited
Suitability for hay and pasture: Well suited
Management concerns: Seasonal wetness and flooding

Woodland

Potential productivity: Very high
Preferred trees to plant: Yellow-poplar and loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Unsuited
Limitations: Seasonal wetness and flooding

Recreational development

Suitability: Unsuited
Limitations: Seasonal wetness and flooding

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 9A

WeB—Wedowee sandy loam, 2 to 6 percent slopes

Setting

Landscape position: Ridges
Slope: Gently sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 18 inches—yellowish red sandy clay that has strong brown mottles
18 to 25 inches—yellowish red sandy clay that has reddish yellow and red mottles
25 to 32 inches—yellowish brown sandy clay loam that has red and very pale brown mottles

Substratum:
32 to 60 inches—mottled red, yellowish brown, and very pale brown saprolite that crushes to sandy clay loam and sandy clay

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- Ashlar and Pacolet soils, which are in landscape positions similar to those of the Wedowee soil

Use and Management

Land Uses: Mainly woodland and pastureland

Field crops, hay, and pasture

Suitability: Well suited
Management concerns: Erosion in unprotected areas
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Well suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.

Recreational development

Suitability: Well suited
Limitations: No significant limitations

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 8A

WeD—Wedowee sandy loam, 6 to 15 percent slopes

Setting

Landscape position: Hillsides
Slope: Sloping or strongly sloping
Slope topography: Convex

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 18 inches—yellowish red sandy clay that has strong brown mottles
18 to 25 inches—yellowish red sandy clay that has reddish yellow and red mottles
25 to 32 inches—yellowish brown sandy clay loam that has red and very pale brown mottles

Substratum:
32 to 60 inches—mottled red, yellowish brown, and very pale brown saprolite that crushes to sandy clay loam and sandy clay

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- Ashlar and Pacolet soils, which are in landscape positions similar to those of the Wedowee soil
- A few areas of alluvial soils that are in the lower landscape positions

Use and Management

Land Uses: Mainly woodland and pastureland

Field crops, hay, and pasture

Suitability for field crops: Moderately suited or poorly suited
Suitability for hay and pasture: Well suited or moderately suited
Management concerns: Erosion in unprotected areas and slope
Management measures and considerations:
- A conservation tillage system helps to increase the content of organic matter, maintain tilth, and reduce the hazard of erosion.
- A water management system helps to reduce the hazard of erosion.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: No significant limitations

Urban uses

Suitability: Moderately suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Moderately suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 8A

WeE—Wedowee sandy loam, 15 to 25 percent slopes

Setting

Landscape position: Hillsides
Slope: Moderately steep
Slope topography: Convex

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown sandy loam

Subsoil:
5 to 18 inches—yellowish red sandy clay that has strong brown mottles
18 to 25 inches—yellowish red sandy clay that has reddish yellow and red mottles
25 to 32 inches—yellowish brown sandy clay loam that has red and very pale brown mottles

Substratum:
32 to 60 inches—mottled red, yellowish brown, and very pale brown saprolite that crushes to sandy clay loam and sandy clay

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate

Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

- A few small areas of Ashlar and Pacolet soils, which are in landscape positions similar to those of the Wedowee soil
- A few areas of Rion soils, which are in the steeper landscape positions
- A few areas of alluvial soils that are on the lower part of the landscape

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Moderately suited
Management concerns: Erosion in unprotected areas and moderately steep slopes
Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; moderately steep slopes which limit the use of heavy equipment
Management measures and considerations:
- Performing planting operations on the contour helps to minimize erosion.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; slope; erosion in unprotected areas
Management measures and considerations:
- Special design and application of septic systems helps to reduce the soil limitations.
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Recreational development

Suitability: Poorly suited
Limitations: Slope; erosion in unprotected areas
Management measures and considerations:
- Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIe
Woodland ordination symbol: 8R

WgE—Wedowee gravelly sandy loam, 10 to 30 percent slopes, very stony

Setting

Landscape position: Hillsides
Landscape features: Prominent, long, narrow hills occurring along a fault line that extends in a southwest-to-northeast direction through the county
Surface features: Scattered cobbles, stones, and boulders occurring near the shoulders and crests of hills and covering 0.1 to 3.0 percent of the surface area
Slope: Strongly sloping to steep
Slope topography: Convex

Typical Profile

Surface layer:
0 to 5 inches—dark brown gravelly sandy loam

Subsoil:
5 to 23 inches—yellowish red sandy clay
23 to 35 inches—yellowish red sandy clay loam that has reddish yellow mottles

Substratum:
35 to 60 inches—yellowish red saprolite that crushes to sandy clay loam and has red and very pale brown mottles

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Poor
Root zone: Very deep

Inclusions

- A few small areas of Ashlar soils, which are on the middle slopes and shoulder slopes
- A few areas of Pacolet soils, which are on the middle slopes and foot slopes
- A few areas of soils that have boulders and are on narrow crests

Use and Management

Land Uses: Woodland

Field crops, hay, and pasture

Suitability: Unsuited

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; moderately steep or steep slopes which limit the use of heavy equipment
Management measures and considerations:
• Performing planting operations on the contour helps to minimize erosion.
• Hand planting reduces the need for heavy machinery.
• Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Poorly suited
Limitations: Slope; moderate permeability in the subsoil which affects septic tank absorption fields; gravel; cobbles, stones, and boulders in some areas of this map unit; erosion in unprotected areas

Recreational development

Suitability: Poorly suited
Limitations: Slope; gravel; cobbles, stones, and boulders in some areas of this map unit; erosion in unprotected areas
Management measures and considerations:
• Maintaining a suitable vegetative cover or mulching, or both, help to keep topsoil in place.

Interpretive Groups

Land capability classification: VIIe
Woodland ordination symbol: 8R

WhB—Wickham sandy loam, 0 to 4 percent slopes, rarely flooded

Setting

Landscape position: Low stream terraces
Flooding: Rare
Slope: Nearly level or gently sloping
Slope topography: Linear to slightly concave

Typical Profile

Surface layer:
0 to 7 inches—yellowish red sandy loam

Subsoil:
7 to 21 inches—reddish brown sandy clay loam
21 to 40 inches—yellowish red sandy clay loam

Substratum:
40 to 52 inches—yellowish red sandy loam
52 to 60 inches—yellowish red loamy sand

Soil Properties and Qualities

Drainage class: Well drained
Natural fertility: Low
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Tilth: Good
Root zone: Very deep

Inclusions

• A few areas of Altavista soils, which are in the lower landscape positions
• A few small areas of Molena soils, which are in the higher landscape positions

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability: Well suited
Management concerns: No significant limitations

Woodland

Potential productivity: Very high
Preferred trees to plant: Loblolly pine and yellow-poplar
Management concerns: No significant limitations

Urban uses

Suitability: Unsuited
Limitations: Moderate permeability in the subsoil which affects septic tank absorption fields; rare flooding
Management measures and considerations:
• A drainage and flood-control system helps to reduce the soil limitations.
• Special design and application of septic systems helps to reduce the soil limitations.

Recreational development

Suitability: Moderately suited
Limitations: Rare flooding

Management measures and considerations:
• A drainage and flood-control system helps to reduce the soil limitations.

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 9A

WkD—Wilkes-Zion complex, 6 to 15 percent slopes

Setting

Landscape position: Wilkes—narrow ridges; Zion—hillsides
Slope: Sloping or strongly sloping
Slope topography: Convex

Composition

Wilkes soil and similar soils: 55 percent
Zion soil and similar soils: 25 percent
Dissimilar soils: 20 percent
Pattern of occurrence: Wilkes and Zion soils occur in a regular repeating pattern; the proportion of each soil varies from one mapped area to another

Typical Profile

Wilkes

Surface layer:
0 to 3 inches—brown sandy loam

Subsurface layer:
3 to 6 inches—yellowish brown sandy loam

Subsoil:
6 to 10 inches—dark yellowish brown sandy clay loam
10 to 18 inches—dark yellowish brown sandy clay loam that has yellow and yellowish red mottles

Substratum:
18 to 45 inches—greenish black, yellowish brown, and gray weathered bedrock
45 inches—hard bedrock

Zion

Surface layer:
0 to 6 inches—brown sandy loam

Subsoil:
6 to 16 inches—yellowish red clay that has strong brown mottles
16 to 25 inches—yellowish red clay loam that has red mottles

Substratum:
25 to 28 inches—mottled dark yellowish brown, yellowish brown, and pale brown saprolite that crushes to sandy loam
28 to 33 inches—multicolored weathered bedrock
33 inches—hard mafic bedrock

Soil Properties and Qualities

Wilkes

Drainage class: Well drained
Natural fertility: Medium
Organic matter content: Low or moderately low
Permeability: Moderately slow
Available water capacity: Very low
Tilth: Good
Root zone: Shallow

Zion

Drainage class: Well drained
Natural fertility: Medium
Organic matter content: Low or moderately low
Permeability: Moderately slow or slow
Available water capacity: Low
Tilth: Good
Root zone: Moderately deep

Inclusions

• A few small areas of Mecklenburg and Wynott soils, which are in landscape positions similar to those of the Zion soil
• A few small areas of soils that have bedrock at a depth of less than 10 inches and are in landscape positions similar to those of the Wilkes soil

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Poorly suited
Management concerns: Slope and depth to bedrock
Management measures and considerations:
• Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Windthrow caused by depth to bedrock

Urban uses

Suitability: Unsuited
Limitations: Slow permeability in the subsoil which affects septic tank absorption fields; moderate or

high shrink-swell potential which limits building site development; depth to bedrock

Recreational development

Suitability: Poorly suited
Limitations: Depth to bedrock

Interpretive Groups

Land capability classification: Wilkes—VIe; Zion—IIIe
Woodland ordination symbol: 6D

WzF—Wynott-Zion-Wilkes complex, 15 to 35 percent slopes

Setting

Landscape position: Wynott—hillsides; Zion—shoulders and hillsides; Wilkes—shoulders
Slope: Moderately steep or steep
Slope topography: Convex

Composition

Wynott soil and similar soils: 30 percent
Zion soil and similar soils: 25 percent
Wilkes soil and similar soils: 25 percent
Dissimilar soils: 20 percent
Pattern of occurrence: Wynott, Zion, and Wilkes soils occur in a regular repeating pattern; the proportion of each soil varies from one mapped area to another

Typical Profile

Wynott

Surface layer:
0 to 5 inches—dark grayish brown sandy clay loam

Subsurface layer:
5 to 9 inches—brown sandy loam

Subsoil:
9 to 17 inches—dark yellowish brown clay
17 to 23 inches—dark yellowish brown sandy clay that has brown mottles

Substratum:
23 to 37 inches—mottled yellowish brown, pale brown, and black saprolite that crushes to sandy loam
37 to 60 inches—greenish black, brown, and gray weathered bedrock

Zion

Surface layer:
0 to 6 inches—brown sandy loam

Subsoil:
6 to 16 inches—yellowish red clay that has strong brown mottles
16 to 25 inches—yellowish red clay loam that has red mottles

Substratum:
25 to 28 inches—mottled dark yellowish brown, yellowish brown, and pale brown saprolite that crushes to sandy loam
28 to 33 inches—multicolored weathered bedrock
33 inches—hard mafic bedrock

Wilkes

Surface layer:
0 to 3 inches—brown sandy loam

Subsurface layer:
3 to 6 inches—yellowish brown sandy loam

Subsoil:
6 to 10 inches—dark yellowish brown sandy clay loam
10 to 18 inches—dark yellowish brown sandy clay loam that has yellow and yellowish red mottles

Substratum:
18 to 45 inches—greenish black, yellowish brown, and gray weathered bedrock
45 inches—hard bedrock

Soil Properties and Qualities

Wynott

Drainage class: Well drained
Natural fertility: Medium
Organic matter content: Low or moderately low
Permeability: Slow
Available water capacity: Moderate
Tilth: Good
Root zone: Moderately deep

Zion

Drainage class: Well drained
Natural fertility: Medium
Organic matter content: Low or moderately low
Permeability: Moderately slow or slow
Available water capacity: Low
Tilth: Good
Root zone: Moderately deep

Wilkes

Drainage class: Well drained
Natural fertility: Medium
Organic matter content: Low or moderately low
Permeability: Moderately slow
Available water capacity: Very low

Tilth: Good
Root zone: Shallow

Inclusions

- A few small areas of Madison soils, which are in landscape positions similar to those of the major soils
- A few small areas of soils that have weathered bedrock at a depth of more than 40 inches and are in landscape positions similar to those of the major soils

Use and Management

Land Uses: Mainly woodland

Field crops, hay, and pasture

Suitability for field crops: Unsuited
Suitability for hay and pasture: Poorly suited
Management concerns: Moderately steep or steep slopes and depth to bedrock
Management measures and considerations:
- Overgrazed pastures should be reestablished and protected.

Woodland

Potential productivity: High
Preferred trees to plant: Loblolly pine
Management concerns: Erosion in unprotected areas; moderately steep or steep slopes which limit the use of heavy equipment; windthrow caused by depth to bedrock
Management measures and considerations:
- Performing planting operations on the contour helps to minimize erosion.
- Hand planting reduces the need for heavy machinery.
- Proper placement of access systems and skid trails helps to reduce the equipment use limitation and minimize erosion.

Urban uses

Suitability: Unsuited
Limitations: Slope; slow permeability in the subsoil which affects septic tank absorption fields; moderate or high shrink-swell potential which limits building site development; depth to bedrock

Recreational development

Suitability: Poorly suited
Limitations: Slope and depth to bedrock

Interpretive Groups

Land capability classification: Wynott and Wilkes—VIIe; Zion—VIe
Woodland ordination symbol: Wynott—7R; Zion and Wilkes—6R

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Generally, the soils in Jasper County that are well suited to crops are also well suited to urban uses. The data concerning specific soils in the county can be used in planning future land use patterns. The potential for farming should be considered relative to any soil limitations and the potential for nonfarm development.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

James E. Dean, Conservation Agronomist; Holli Kuykendall, Grassland Water Quality Specialist; and Joshua A. Wheat, District Conservationist, Natural Resources Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils are identified, the system of land capability classification used by the Natural Resources Conservation Service is explained, the estimated yields of the main crops and hay and pasture plants are listed for each soil, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units" and in the tables. Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Federal and State regulations require that any area designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

Where slopes are more than 3 percent, soil erosion is a potential hazard on cropland and pasture in the survey area. Loss of the surface layer through erosion is damaging. Soil productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that have a shallow surface layer or a clayey subsoil, or both. Most of the soils commonly used for crops and pasture in Jasper County have a clayey subsoil. Appling, Cecil, Lloyd, Madison, and Pacolet soils are examples. Some soils have a layer in or below the subsoil that limits the depth of the root zone. For example, the depth of the root zone in Ashlar soils is limited by bedrock. Erosion also reduces productivity on soils that tend to be droughty, such as Molena soils.

Erosion on farmland results in the sedimentation of streams. Controlling erosion minimizes the pollution of water by sediment and improves the quality of water

for municipal use, for recreation, and for fish and wildlife.

Preparing a good seedbed is difficult in many sloping fields because of clayey spots, where the original friable surface soil has eroded away. Such spots are common in areas of the eroded Cecil and Pacolet soils.

Erosion-control practices provide a protective surface cover, reduce runoff, and increase the rate of water infiltration. A cropping system that keeps a vegetative cover on the soil for extended periods helps to minimize soil loss and maintain the productive capacity of the soil. On livestock farms, including legume and grass forage crops in the cropping system and in permanent pasture and hayland helps to control erosion on sloping land, provide nitrogen, and improve soil tilth for the following crop.

In most areas of Cecil, Gwinnett, Lloyd, Madison, Pacolet, and Wedowee soils on hillsides with slopes of more than 6 percent, slopes are so short and irregular that contour farming or terracing is not practical. On these soils, cropping systems that provide a substantial cover of plant residue are needed to control erosion. Residue management, conservation tillage, cover crops, stripcropping, and the inclusion of grasses and legumes in crop rotations help to protect the soil surface, increase the rate of water infiltration, and reduce the hazards of runoff and erosion. These practices can be adapted to most of the soils in the survey area.

Terraces and diversions shorten the length of slopes and thus minimize erosion caused by runoff. They are most effective on deep, well drained, gently sloping soils that are on smooth, convex ridges. Appling, Cecil, and Lloyd soils are examples.

Most soils used for cropland are subject to soil erosion if they are plowed in fall and left bare until spring. Winter cover crops should be planted where cropland is plowed in fall.

Bottomland soils in the survey area include Chewacla and Toccoa soils. Crop production on Chewacla soils is generally not practical unless drainage systems are used. Existing drainage systems need to be continually maintained on these soils. Bottomland soils are also subject to flooding.

Information about erosion-control and drainage practices for each kind of soil is available at the local office of the Natural Resources Conservation Service. Drainage is a major consideration in managing crops and pasture. Management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning.

Soil fertility is naturally low in most upland soils in the survey area. Most soils in the survey area are naturally acid. Soils on flood plains, such as Chewacla and Toccoa soils, range from slightly acid to strongly acid.

Many soils on the uplands are strongly acid or very strongly acid in their natural state. Ground limestone needs to be applied to raise the pH level for good growth of legumes and other crops because available phosphorus and potash levels are naturally low in most of these soils. On all soils, the amount of lime, fertilizer, and organic wastes to be applied should be based on the results of soil tests, realistic crop yields, waste analysis, and a nutrient management plan. The Cooperative Extension Service and the Natural Resources Conservation Service can provide information concerning nutrient management plans.

Soil organic matter is an important factor in the germination of seeds, root growth, the infiltration of water into the soil, and soil erosion. Soils that have good tilth are granular and porous.

Most of the soils used for crops in the survey area have a surface layer of sandy loam that is low in organic matter. Generally, the structure of these soils is poor and intense rainfall results in the formation of a crust on the soil surface. This crust is hard when dry, and it reduces the rate of water infiltration, hinders plant growth, and increases runoff. Crop residue management, conservation tillage, stripcropping, the inclusion of grasses and legumes in crop rotations, and regular additions of manure and other organic material help to improve soil structure and prevent the formation of a crust.

Crops commonly grown in the survey area are corn, soybeans, and wheat. Some field crops, such as cotton, that are suited to the soils and climate of the survey area are not commonly grown. Specialty crops are sweet corn, tomatoes, and other vegetables.

Deep soils that have good natural drainage and warm up early in spring are especially well suited to many vegetables. Examples are Appling, Cecil, Lloyd, and Pacolet soils that have slopes of less than 6 percent.

Most of the well drained soils in the survey area are suitable for orchards and nursery plants. However, soils in low landscape positions, where frost is frequent and air movement is inadequate, generally are poorly suited to early vegetables, small fruits, orchards, and nursery plants.

If adequately managed and protected from flooding, most of the soils on flood plains are suited to a wide range of vegetable crops.

Technical assistance and information about growing speciality crops is available at local agricultural agencies.

Pasture and hayland typically consist of a mixture of

endophyte-infected tall fescue and common bermudagrass. This combination provides forage for both cool- and warm-season grazing. Where deferred grazing management is practiced, native warm-season perennial grasses, such as eastern gamagrass, switchgrass, and indiangrass, can be used for high-quality, palatable forage. Alfalfa can be grown as a specialty forage crop.

Irrigation is beneficial in the production of orchard and specialty crops. The major source of water for irrigation is surface water from streams and ponds.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

A high level of management includes maintaining proper soil pH and fertility levels as indicated by standard soil tests, Extension Service guidelines, and nutrient management plans. The application of fertilizer in excess of that required for potential yields is not recommended. Excess fertilizer that is not utilized by the crop is an unnecessary expense and causes a hazard of water pollution. Also, the method of fertilizer application should be suited to the crop grown. For example, since nitrogen can be easily leached from soils into the water table, applications of nitrogen fertilizer for crops such as corn are commonly split and nitrogen is applied more than once during the growing season. If a nonleguminous crop, such as corn or cotton, is grown following the harvest of legumes, such as soybeans, nitrogen applications should be reduced to account for the nitrogen provided by the crop residue of decaying legumes.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 27,845 acres in Jasper County, or 11.6 percent of the total acreage, meets the soil requirements for prime farmland. Scattered areas of this land are throughout the county, but most are in general soil map units 3 and 4, which are described under the heading "General Soil Map Units."

The map units in the survey area that are considered prime farmland are listed in table 6. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Woodland Management and Productivity

Woodland is the dominant land use in Jasper County. Approximately 186,845 acres, or 78 percent of the county's total land area, is forest land. The majority of the forest land is privately owned. Loblolly pine and other pines make up almost 50 percent of the county's forest land. More than 30 percent of the forest land consists of the oak-hickory forest type. An oak-pine mixture makes up the remaining 20 percent *(9)*.

Generally, the most productive forests on upland soils in Jasper County are in the gently sloping and sloping areas of general soil map units 3 and 4, which are described in the section "General Soil Map Units." Generally, these map units have few management limitations.

The strongly sloping to steep soils in general soil map units 6, 7, and 8 are less productive than most of the other soils in the county. In most areas of these map units, erosion is a concern and the use of equipment is limited because of the slope. Seedling mortality is an additional limitation in eroded areas.

The most productive soils in the county are in the flood plain areas of general soil map unit 1. All the major soils in this map unit are frequently flooded. Seedling mortality is a concern in ponded areas. The use of equipment is limited on most flood plain soils.

Of particular interest for woodland managers in Jasper County are the Iredell soils in general soil map unit 2. Although these soils are localized in one general area in the southern part of the county and are only moderately productive for woodland, they are

special because they support a variety of unique species. This area has one of the most extensive remaining populations of Oglethorpe oak, a state-protected species.

Soils vary in their ability to produce trees. The depth of the root zone, fertility, texture, and the available water capacity influence tree growth. Climate and landscape position determine the kinds of trees that can grow on a site.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce in a pure stand under natural conditions. The number 1 indicates low potential productivity; 2 or 3, moderate; 4 or 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *W*, excess water in or on the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; and *S*, sandy texture. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, W, D, C, and S.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *productivity class*. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *productivity class*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Recreation

The soils of the survey area are rated in table 8 according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders and absorbs rainfall readily but remains firm. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the period of use. The surface is free of stones and boulders and is firm after rains. If grading is needed, the depth of the soil over bedrock should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat. The ratings in table 9 are intended to be used as a guide and are not site specific. Onsite investigation is needed for individual management plans.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, partridge pea, croton, and ragweed.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are dogwood, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, arrowleaf, rushes, and sedges.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, muskrat, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed

performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock or a very firm, dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the high water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, and shrinking and swelling can cause the movement of footings. Depth to a high water table, depth to bedrock, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, depth to a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, depth to bedrock, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established. Soil tests

are essential to determine liming and fertilizer needs. Help in making soil tests or in deciding what soil additive, if any, should be used can be obtained from the office of the Upper Ocmulgee River Soil and Water Conservation District or the local office of the Cooperative Extension Service.

Sanitary Facilities

Table 11 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. The animal waste lagoons commonly used in farming operations are not considered in the ratings. They are generally deeper than the lagoons referred to in the table and rely on anaerobic bacteria to decompose waste materials.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, depth to bedrock, flooding, and large stones.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. Slope or bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, and soil reaction affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or

moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the high water table is more than 3 feet. Soils rated *fair* have more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the high water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a high water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as weathered granite saprolite, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a high water table, soil texture, and thickness of suitable material.

Reclamation of the borrow area is affected by slope, a high water table, rock fragments, and bedrock.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are naturally fertile or respond well to fertilizer and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel or stones, have slopes of more than 15 percent, or have a high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area. Ponds that are less than about 2 acres in size are not shown on the maps because of the scale of mapping.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or mica. Depth to a high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, and susceptibility to flooding. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity. Availability of drainage outlets is not considered in the ratings.

Drainage may be a major management consideration in some areas. Management of drainage in conformance with regulations concerning wetlands may require special permits and extra planning. The local office of the Natural Resources Conservation Service should be contacted for identification of hydric soils and potential wetlands.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to a high water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock. The performance of a system is affected by the availability of suitable irrigation water, the depth of the root zone, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve

moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages, by weight, of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, by volume, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest.

Rock fragments 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3

inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence the shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water through the soil when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage in each major soil layer is stated in inches of water per inch of soil. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time. It is the difference between the amount of soil water at field moisture capacity and the amount at wilting point.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent;

moderate, 3 to 6 percent; *high*, more than 6 percent; and *very high*, more than 9 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep or very deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep to very deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in table 16, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams or by runoff from adjacent slopes. Shallow water standing or flowing for short periods after rainfall is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 16 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year). *Common* is used when occasional and frequent classes are grouped for certain purposes. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a

saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in table 16 are the depth to the high water table; the kind of water table—that is, *perched* or *apparent*; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 16.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the high water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(11)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 17 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders, primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udult (*Ud*, meaning humid, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludults (*Hapl*, meaning minimal horizon development, plus *udult*, the suborder of the Ultisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, thermic Typic Hapludults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the substratum within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The location of the typical pedon is described, and coordinates generally are identified by longitude and latitude. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(13)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(11)* and in "Keys to Soil Taxonomy" *(12)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Altavista Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate

Parent material: Loamy alluvium
Depth to high water table: 1.5 to 2.5 feet
Landscape position: Low stream terraces
Slope range: 0 to 3 percent
Classification: Fine-loamy, mixed, semiactive, thermic Aquic Hapludults

Geographically Associated Soils

- Molena soils, which are sandy throughout
- Wickham soils, which are well drained

Typical Pedon

Altavista sandy loam, 0 to 3 percent slopes, rarely flooded; 4.0 miles northwest of Shady Dale, Georgia, on Georgia Highway 83 to the Morgan County line, 1.0 mile southeast on a field road to a pond, 650 feet southeast of the pond; USGS Shady Dale topographic quadrangle (1972); lat. 33 degrees 26 minutes 3 seconds N. and long. 83 degrees 32 minutes 6 seconds W.

Ap—0 to 6 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine and few medium roots; strongly acid; clear smooth boundary.

E—6 to 10 inches; pale brown (10YR 6/3) sandy loam; weak fine granular structure; very friable; common fine roots; strongly acid; clear wavy boundary.

Bt1—10 to 24 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.

Bt2—24 to 36 inches; yellowish brown (10YR 5/6) sandy clay loam; few fine prominent light gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.

C1—36 to 45 inches; mottled brownish yellow (10YR 6/8), strong brown (7.5YR 5/6), and gray (10YR 6/1) sandy clay loam that has pockets of finer textured material; massive; firm; very strongly acid; gradual wavy boundary.

C2—45 to 60 inches; mottled brownish yellow (10YR 6/8), strong brown (7.5YR 5/6), yellow (10YR 7/6), and gray (10YR 6/1) stratified sandy loam and sandy clay loam; massive; friable; common fine flakes of mica; very strongly acid.

Range in Characteristics

Thickness of the solum: 34 to 48 inches
Depth to mottles with chroma of 2 or less: 14 to 23 inches below the top of the argillic horizon
Reaction: Very strongly acid to moderately acid

A horizon:
Thickness—5 to 7 inches
Color—hue of 10YR, value of 4, and chroma of 3
Texture—sandy loam

E horizon (if it occurs):
Color—hue of 10YR, value of 6, and chroma of 3
Texture—sandy loam

Bt horizon (upper part):
Color—hue of 10YR, value of 5 or 6, and chroma of 6; mottles in shades of brown occur in some pedons
Texture—sandy clay loam

Bt horizon (lower part):
Color—hue of 10YR, value of 5 or 6, and chroma of 6; horizon has mottles in shades of gray or red
Texture—sandy clay loam or clay loam

C horizon:
Color—mottled in shades of brown, yellow, and gray
Texture—coarse sandy loam, sandy loam, or sandy clay loam

Appling Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum from acid crystalline rock
Landscape position: Ridges
Slope range: 2 to 6 percent
Classification: Fine, kaolinitic, thermic Typic Kanhapludults

Geographically Associated Soils

- Cecil soils, which have a red subsoil
- Lloyd soils, which have a dark red and red subsoil
- Wedowee soils, which have a solum that is thinner than that of the Appling soils

Typical Pedon

Appling sandy loam, 2 to 6 percent slopes; 4.2 miles north of Monticello, Georgia, on Georgia Highway 11 to the intersection with Liberty Church Road, 0.8 mile northwest on Georgia Highway 11, about 2,200 feet northeast of the road; USGS Farrar topographic quadrangle (1972); lat. 33 degrees 23 minutes 39 seconds N. and long. 83 degrees 44 minutes 53 seconds W.

A—0 to 6 inches; brown (10YR 4/3) sandy loam; weak

fine granular structure; very friable; common very fine roots; strongly acid; clear smooth boundary.
BA—6 to 10 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; firm; few very fine roots; very strongly acid; gradual wavy boundary.
Bt1—10 to 32 inches; yellowish brown (10YR 5/8) sandy clay; common medium distinct brownish yellow (10YR 6/6) and common medium prominent yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.
Bt2—32 to 41 inches; yellowish brown (10YR 5/8) sandy clay; common medium and fine distinct very pale brown (10YR 8/4) and yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.
BC—41 to 51 inches; mottled yellowish brown (10YR 5/8), pale yellow (2.5Y 7/4), and strong brown (7.5YR 5/8) sandy clay loam that has pockets of sandy loam; massive; friable; very strongly acid; gradual wavy boundary.
C—51 to 60 inches; mottled yellowish brown (10YR 5/8), light yellowish brown (2.5Y 6/4), and red (2.5YR 4/8) sandy clay that has pockets of sandy clay loam and sandy loam; massive; firm; very strongly acid.

Range in Characteristics

Thickness of the solum: 41 to 55 inches
Reaction: Very strongly acid or strongly acid, except where the surface layer has been limed

A horizon:
Thickness—6 to 10 inches
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4
Texture—sandy loam

BA horizon (if it occurs):
Color—hue of 10YR, value of 5, and chroma of 4 to 6
Texture—sandy clay loam

Bt horizon (upper part):
Color—hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8; horizon has mottles in shades of red or yellow
Texture—sandy clay

Bt horizon (lower part):
Color—hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 6 or 8; horizon has mottles in shades of red, yellow, or brown
Texture—sandy clay or clay

BC horizon (if it occurs):
Color—mottled in shades of red, yellow, and brown
Texture—sandy clay loam

C horizon:
Color—mottled in shades of yellow, brown, and red
Texture—sandy clay or sandy clay loam; horizon has pockets of loamy material in some pedons

Ashlar Series

Depth class: Moderately deep
Drainage class: Excessively drained
Permeability: Moderately rapid
Parent material: Granitic gneiss
Landscape position: Shoulders and hillsides
Slope range: 2 to 25 percent
Classification: Coarse-loamy, mixed, semiactive, thermic Typic Dystrochrepts

Geographically Associated Soils

- Pacolet and Wedowee soils, which are in a clayey family
- Rion soils, which are in a fine-loamy family

Typical Pedon

Ashlar coarse sandy loam in an area of Ashlar-Pacolet complex, 15 to 25 percent slopes; 4.5 miles southwest of Georgia Highway 11 at the Newton-Jasper County line on a county road, 100 feet west of the road; USGS Stewart topographic quadrangle; lat. 33 degrees 25 minutes 27 seconds N. and long. 83 degrees 48 minutes 51 seconds W.

A—0 to 7 inches; yellowish brown (10YR 5/4) coarse sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.
Bw—7 to 15 inches; brownish yellow (10YR 6/6) coarse sandy loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; gradual wavy boundary.
C—15 to 25 inches; brownish yellow (10YR 6/6) loamy coarse sand; single grained; very friable; few medium and large roots; very strongly acid; clear wavy boundary.
R—25 inches; hard granitic gneiss.

Range in Characteristics

Thickness of the solum: 15 to 29 inches
Depth to hard bedrock: 23 to 40 inches
Content of coarse fragments: 0 to 15 percent
Reaction: Very strongly acid or strongly acid

A horizon:
Thickness—4 to 7 inches
Color—hue of 2.5Y or 10YR, value of 4 or 5, and chroma of 2 to 4
Texture—coarse sandy loam

Bw horizon:
Color—hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8; pink mottles occur in the lower part of horizon in some pedons
Texture—sandy loam or coarse sandy loam

C horizon:
Color—horizon is brownish yellow or is mottled in shades of yellow, brown, and white
Texture—loamy coarse sand or coarse sandy loam

Buncombe Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Parent material: Sandy alluvium
Landscape position: Flood plains (fig. 7)
Slope range: 0 to 6 percent
Classification: Mixed, thermic Typic Udipsamments

Geographically Associated Soils

- Chewacla soils, which are fine-loamy and are somewhat poorly drained
- Shellbluff soils, which are fine-silty and well drained
- Toccoa soils, which are coarse-loamy and well drained and moderately well drained

Typical Pedon

Buncombe loamy sand, 0 to 6 percent slopes, occasionally flooded; 0.2 mile north of Georgia Highway 16 on Old State Route 221, about 100 feet west of the road; USGS Lloyd Shoals Dam topographic quadrangle (1964); lat. 33 degrees 18 minutes 22 seconds N. and long. 83 degrees 50 minutes 12 seconds W.

A—0 to 10 inches; dark yellowish brown (10YR 4/4) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

C1—10 to 35 inches; yellowish brown (10YR 5/4) sand; single grained; loose; few very fine flakes of mica; few fine and medium roots; very strongly acid; gradual wavy boundary.

C2—35 to 55 inches; yellowish brown (10YR 5/4) sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; loose; few very fine flakes of mica; very strongly acid; gradual wavy boundary.

C3—55 to 60 inches; dark yellowish brown (10YR 4/4) loamy sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; very friable; very strongly acid.

Range in Characteristics

Thickness of sand: 40 to more than 60 inches
Reaction: Very strongly acid or strongly acid

A horizon:
Thickness—6 to 10 inches
Color—hue of 10YR, value of 3 or 4, and chroma of 4
Texture—loamy sand

C horizon (upper part):
Color—hue of 7.5YR to 10YR, value of 5, and chroma of 4 to 8; horizon has mottles in shades of brown or yellow
Texture—sand or loamy sand

C horizon (lower part):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8; horizon has mottles in shades of brown or yellow
Texture—sand or loamy sand

Cecil Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum from acid crystalline rock
Landscape position: Ridges and hillsides
Slope range: 2 to 10 percent
Classification: Fine, kaolinitic, thermic Typic Kanhapludults

Geographically Associated Soils

- Appling soils, which have a brown subsoil
- Gwinnett soils, which have a dark red subsoil and a solum that is thinner than that of the Cecil soils
- Lloyd soils, which have a dark red and red subsoil
- Pacolet soils, which have a solum that is thinner than that of the Cecil soils

Typical Pedon

Cecil sandy loam, 2 to 6 percent slopes; 700 feet northeast of the intersection of Georgia Highways 83 and 142 at Shady Dale, Georgia, 500 feet northwest of Highway 83; USGS Shady Dale topographic quadrangle (1972); lat. 33 degrees 24 minutes 10 seconds N. and long. 83 degrees 35 minutes 13 seconds W.

A—0 to 8 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

BA—8 to 11 inches; reddish brown (5YR 5/4) sandy clay loam; weak fine subangular blocky structure; friable; common fine roots; very strongly acid; clear smooth boundary.

Bt1—11 to 24 inches; red (2.5YR 4/6) sandy clay; moderate medium subangular blocky structure; firm; few medium roots; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—24 to 37 inches; red (2.5YR 4/6) sandy clay; common medium prominent reddish yellow (7.5YR 6/6) mottles; weak medium subangular blocky structure; firm; common distinct clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.

BC—37 to 48 inches; red (2.5YR 4/8) sandy clay loam; common medium prominent reddish yellow (7.5YR 7/6) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.

C—48 to 60 inches; mottled red (2.5YR 4/8) and reddish yellow (7.5YR 7/6) saprolite that crushes to sandy clay loam; massive; friable; few fine flakes of mica; very strongly acid.

Range in Characteristics

Thickness of the solum: 43 to 60 inches
Reaction: Very strongly acid or strongly acid

A horizon:
Thickness—4 to 8 inches
Color—hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6
Texture—sandy loam or sandy clay loam

Bt horizon (upper part):
Color—hue of 2.5YR, value of 4 or 5, and chroma of 6 or 8
Texture—sandy clay

Bt horizon (lower part):
Color—hue of 2.5YR, value of 4 or 5, and chroma of 6 or 8; horizon has mottles in shades of red, yellow, or brown
Texture—sandy clay or clay

BC horizon (if it occurs):
Color—hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8; horizon has mottles in shades of yellow or brown
Texture—sandy clay loam

C horizon:
Color—mottled in shades of red, brown, and yellow
Texture—saprolite that crushes to sandy loam or sandy clay loam

Chewacla Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Loamy alluvium
High water table: 1.0 foot above the surface to 2 feet below
Landscape position: Flood plains
Slope range: 0 to 2 percent
Classification: Fine-loamy, mixed, semiactive, thermic Fluvaquentic Dystrochrepts

Geographically Associated Soils

- Roanoke soils, which are clayey and poorly drained
- Shellbluff soils, which are fine-silty and well drained
- Toccoa soils, which are coarse-loamy and well drained and moderately well drained

Typical Pedon

Chewacla silt loam, 0 to 2 percent slopes, frequently flooded; 3.8 miles northeast of Monticello, Georgia, on Georgia Highway 83, about 100 feet east of the road; USGS Monticello topographic quadrangle (1973); lat. 33 degrees 23 minutes 50 seconds N. and long. 83 degrees 38 minutes 41 seconds W.

A—0 to 6 inches; brown (7.5YR 4/3) silt loam; weak fine granular structure; very friable; many fine roots; common fine flakes of mica; moderately acid; clear smooth boundary.

Bw1—6 to 20 inches; brown (7.5YR 4/4) silty clay loam; common medium prominent yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; common fine roots; few fine flakes of mica; moderately acid; gradual wavy boundary.

Bw2—20 to 32 inches; brown (7.5YR 4/4) silty clay loam; common medium prominent grayish brown

(10YR 5/2) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine flakes of mica; slightly acid; clear wavy boundary.

Bg—32 to 38 inches; dark grayish brown (10YR 4/2) sandy clay loam; many fine prominent strong brown (7.5YR 4/6) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine flakes of mica; slightly acid; clear wavy boundary.

Cg1—38 to 44 inches; dark grayish brown (10YR 4/2) sandy clay loam; massive; friable; common fine flakes of mica; slightly acid; clear wavy boundary.

Cg2—44 to 52 inches; brown (7.5YR 4/2) silty clay loam; massive; friable; common fine flakes of mica; slightly acid; clear wavy boundary.

Cg3—52 to 58 inches; dark grayish brown (10YR 4/2) loamy sand; single grained; common fine flakes of mica; slightly acid; clear wavy boundary.

Cg4—58 to 65 inches; dark grayish brown (10YR 4/2) silty clay loam; massive; friable; common fine flakes of mica; slightly acid.

Range in Characteristics

Thickness of the solum: 22 to 48 inches
Depth to mottles with chroma of 2 or less: 8 to 22 inches
Reaction: Very strongly acid to slightly acid

A horizon:
Thickness—4 to 8 inches
Color—hue of 5YR to 10YR, value of 4, and chroma of 3 or 4
Texture—silt loam

Bw horizon:
Color—hue of 5YR to 10YR, value of 4, and chroma of 4 to 6; horizon has mottles in shades of gray or brown
Texture—fine sandy loam, loam, or silty clay loam

Bg horizon (if it occurs):
Color—hue of 10YR, value of 4 or 5, and chroma of 2; horizon has mottles in shades of brown
Texture—sandy clay loam or loam

BC horizon (if it occurs):
Color—mottled in shades of gray and brown
Texture—fine sandy loam or loam

Cg horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 0 to 2
Texture—loamy sand, sandy loam, sandy clay loam, silty clay loam, or silty clay

Gwinnett Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum from basic and intermediate crystalline rock
Landscape position: Ridges and hillsides
Slope range: 6 to 25 percent
Classification: Fine, kaolinitic, thermic Rhodic Kanhapludults

Geographically Associated Soils

- Lloyd soils, which have a solum that is thicker than that of the Gwinnett soils
- Pacolet soils, which have a red subsoil

Typical Pedon

Gwinnett sandy clay loam, 15 to 25 percent slopes, eroded; 4 miles southeast of Monticello, Georgia, on Georgia Highway 212, about 2,400 feet north on a county road, about 1,800 feet east of the road; USGS Smithboro topographic quadrangle (1972); lat. 33 degrees 15 minutes 17 seconds N. and long. 83 degrees 33 minutes 39 seconds W.

A—0 to 5 inches; dark reddish brown (2.5YR 3/4) sandy clay loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.

Bt1—5 to 15 inches; dark red (2.5YR 3/6) sandy clay; moderate medium subangular blocky structure; firm; few medium and coarse roots; few distinct clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bt2—15 to 37 inches; dark red (2.5YR 3/6) clay; few medium prominent yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.

C—37 to 52 inches; dark red (2.5YR 3/6) sandy clay loam; few fine prominent reddish yellow (5YR 6/8) mottles; massive; many fine flakes of mica; very strongly acid; abrupt smooth boundary.

Cr—52 to 60 inches; highly weathered hornblende gneiss.

Range in Characteristics

Thickness of the solum: 27 to 39 inches
Depth to soft bedrock: 51 to 60 inches (fig. 8)
Reaction: Very strongly acid or strongly acid, except where the surface layer has been limed

A horizon:
Thickness—4 to 10 inches
Color—hue of 2.5YR or 5YR, value of 3, and chroma of 4
Texture—sandy loam or sandy clay loam

Bt horizon:
Color—hue of 2.5YR, value of 3, and chroma of 6; mottles in shades of red or brown occur in the lower part of horizon
Texture—sandy clay or clay

C horizon:
Color—hue of 2.5YR or 5YR, value of 3 or 4, and chroma of 6; horizon has mottles in shades of red, yellow, or brown
Texture—sandy clay loam

Cr horizon:
Texture—weathered bedrock

Iredell Series

Depth class: Deep and very deep
Drainage class: Moderately well drained
Permeability: Slow
Parent material: Residuum from gabbro and other rocks having a high content of ferromagnesium minerals
Depth to high water table: 1.0 to 2.0 feet (perched)
Landscape position: Upland flats, ridges, and hillsides
Slope range: 0 to 10 percent
Classification: Fine, smectitic, thermic Typic Hapludalfs

Geographically Associated Soils

- Mecklenburg soils, which are Ultic Hapludalfs
- Wilkes soils, which are shallow
- Zion soils, which are moderately deep

Typical Pedon

Iredell fine sandy loam, 0 to 6 percent slopes; 8 miles south of Monticello, Georgia, on Georgia Highway 83, about 300 feet southeast of the highway; USGS Berner topographic quadrangle (1981); lat. 33 degrees 12 minutes 39 seconds N. and long. 83 degrees 45 minutes 38 seconds W.

A—0 to 5 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; few coarse and medium quartz gravel; moderately acid; clear smooth boundary.
Bt1—5 to 20 inches; dark yellowish brown (10YR 4/4) clay; moderate medium angular blocky structure; very firm, very sticky, very plastic; few fine and medium roots; common distinct clay films on faces of peds; many fine black concretions; slightly acid; gradual wavy boundary.
Bt2—20 to 24 inches; dark yellowish brown (10YR 4/6) clay; moderate medium angular blocky structure; very firm, very sticky, very plastic; few medium roots; common distinct clay films on faces of peds; few fine black concretions; slightly acid; gradual wavy boundary.
C1—24 to 40 inches; mottled yellowish brown (10YR 5/6), yellow (10YR 8/6), and dark gray (10YR 4/1) saprolite that crushes to sandy clay loam; massive; friable; neutral; gradual wavy boundary.
C2—40 to 60 inches; mottled very pale brown (10YR 8/3), light brownish gray (2.5Y 6/2), and gray (2.5Y 5/1) saprolite that crushes to sandy loam; massive; very friable; neutral.

Range in Characteristics

Thickness of the solum: 24 to 38 inches
Content of coarse fragments: 0 to 15 percent in the A horizon
Reaction: Moderately acid to neutral in the A horizon; slightly acid to mildly alkaline in the B and C horizons

A horizon:
Thickness—4 to 6 inches
Color—hue of 10YR to 5Y, value of 4, and chroma of 2 or 3
Texture—fine sandy loam

Bt horizon (upper part):
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6
Texture—clay

Bt horizon (lower part):
Color—hue of 10YR to 5Y, value of 4 to 6, and chroma of 3 to 6
Texture—clay

BC horizon (if it occurs):
Color—mottled in shades of olive, brown, yellow, gray, and white
Texture—clay loam or sandy clay

C horizon:
Color—mottled in shades of olive, brown, white, and gray
Texture—saprolite that crushes to sandy loam or sandy clay loam

Lloyd Series

Depth class: Very deep
Drainage class: Well drained

Permeability: Moderate
Parent material: Residuum from hornblende gneiss
Landscape position: Ridges and hillsides
Slope range: 2 to 30 percent
Classification: Fine, kaolinitic, thermic Rhodic Kanhapludults

Geographically Associated Soils

- Cecil and Pacolet soils, which do not have a subsoil that is dark red in the upper part
- Gwinnett soils, which have a solum that is thinner than that of the Lloyd soils and have dark red colors throughout

Typical Pedon

Lloyd loam, 2 to 6 percent slopes; 1.7 miles south of Monticello, Georgia, on Georgia Highway 11, about 4.6 miles south on a county road, 100 feet northeast of the road; USGS Stanfordville topographic quadrangle (1977); lat. 33 degrees 13 minutes 52 seconds N. and long. 83 degrees 36 minutes 54 seconds W.

Ap—0 to 9 inches; dark reddish brown (2.5YR 3/3) loam; moderate fine granular structure; very friable; many fine and common medium roots; few fine flakes of mica: moderately acid; clear smooth boundary.

Bt1—9 to 17 inches; dark red (2.5YR 3/6) clay loam; weak medium subangular blocky structure; firm; few fine roots; few distinct clay films on faces of peds; few fine soft black concretions; moderately acid; gradual wavy boundary.

Bt2—17 to 33 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm; few medium roots; common distinct clay films on faces of peds; few fine soft black concretions; few fine flakes of mica; strongly acid; clear wavy boundary.

Bt3—33 to 46 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm; few distinct clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

BC—46 to 56 inches; red (2.5YR 4/8) clay loam; weak medium subangular blocky structure; friable; common fine flakes of mica; strongly acid; gradual wavy boundary.

C—56 to 60 inches; red (2.5YR 4/8) saprolite that crushes to loam; massive; friable; many fine flakes of mica; strongly acid.

Range in Characteristics

Thickness of the solum: 40 to 60 inches or more (fig. 9)
Reaction: Slightly acid to very strongly acid, except where the surface layer has been limed

A horizon:
Thickness—4 to 9 inches
Color—hue of 2.5YR or 5YR, value of 3, and chroma of 2 to 4
Texture—loam or clay loam

Bt horizon (upper part):
Color—hue of 2.5YR or 10R, value of 3, and chroma of 4 to 6
Texture—sandy clay, clay loam, or clay

Bt horizon (lower part):
Color—hue of 2.5YR or 10R, value of 4, and chroma of 4 to 8; mottles in shades of yellow or brown occur in some pedons
Texture—sandy clay or clay

BC horizon (if it occurs):
Color—similar to colors of the lower Bt horizon
Texture—clay loam or sandy clay loam

C horizon:
Color—hue of 2.5YR or 10R, value of 3 or 4, and chroma of 6 to 8; in some pedons, horizon has mottles in shades of brown or yellow or is mottled in shades of red, brown, and yellow
Texture—soft saprolite that crushes to loam, sandy clay loam, or clay loam

Madison Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum from mica schist
Landscape position: Hillsides
Slope range: 6 to 30 percent
Classification: Fine, kaolinitic, thermic Typic Kanhapludults

Geographically Associated Soils

- Pacolet soils, which do not have many flakes of mica in the lower part of the solum
- Wilkes soils, which are shallow and have mixed mineralogy
- Wynott and Zion soils, which have mixed mineralogy and have a sticky and plastic subsoil

Typical Pedon

Madison sandy loam, 6 to 15 percent slopes; 5.3 miles northeast of Monticello, Georgia, on Georgia Highway 83, about 300 feet west of the road; USGS Monticello topographic quadrangle (1972); lat. 33 degrees 21 minutes 51 seconds N. and long. 83 degrees 37 minutes 42 seconds W.

A—0 to 5 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; many fine roots; few fine flakes of mica; strongly acid; clear smooth boundary.
Bt1—5 to 10 inches; yellowish red (5YR 5/6) sandy clay; weak medium subangular blocky structure; firm; few fine roots; few fine flakes of mica; strongly acid; gradual wavy boundary.
Bt2—10 to 17 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; common fine flakes of mica; strongly acid; gradual wavy boundary.
Bt3—17 to 24 inches; red (2.5YR 4/6) sandy clay; moderate medium subangular blocky structure; firm; few fine roots; few faint and few distinct clay films on faces of peds; many fine flakes of mica; strongly acid; gradual wavy boundary.
BC—24 to 38 inches; red (2.5YR 4/6) sandy clay loam; common medium prominent yellow (10YR 7/6) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; few faint and few distinct clay films on faces of peds; many fine flakes of mica; strongly acid; gradual wavy boundary.
C1—38 to 50 inches; mottled yellowish red (5YR 5/8), reddish yellow (7.5YR 6/8), and brown (10YR 4/3) saprolite that crushes to sandy clay loam; massive; very friable; many fine and medium flakes of mica; strongly acid; gradual wavy boundary.
C2—50 to 60 inches; mottled brown (10YR 4/3), reddish yellow (7.5YR 6/8), and yellowish red (5YR 5/8) saprolite that crushes to sandy loam; massive; very friable; many fine flakes of mica; strongly acid.

Range in Characteristics

Thickness of the solum: 27 to 38 inches
Reaction: Very strongly acid or strongly acid
Content of flakes of mica: Common or many in the upper horizons; many in the lower part of the solum (fig. 10)

A horizon:
Thickness—4 to 8 inches
Color—hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6
Texture—sandy loam or sandy clay loam

Bt horizon:
Color—hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8; mottles in shades of red or brown occur in some subhorizons
Texture—sandy clay or clay

BC horizon (if it occurs):
Color—hue of 2.5YR or 5YR, value of 4, and chroma of 6 or 8; horizon has mottles in shades of yellow or brown or is mottled in shades of red and brown
Texture—sandy clay loam

C horizon:
Color—hue of 2.5YR or 5YR, value of 4, and chroma of 6; horizon has mottles in shades of brown or is mottled in shades of red, brown, and yellow
Texture—saprolite that crushes to sandy loam or sandy clay loam

Mecklenburg Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Parent material: Residuum from mafic rock
Landscape position: Ridges and hillsides
Slope range: 2 to 10 percent
Classification: Fine, mixed, active, thermic Ultic Hapludalfs

Geographically Associated Soils

- Lloyd soils, which do not have a sticky and plastic subsoil
- Iredell soils, which have a subsoil that is yellower than that of the Mecklenburg soils
- Zion soils, which have hard bedrock at a depth of less than 40 inches

Typical Pedon

Mecklenburg loam, 6 to 10 percent slopes; 4.0 miles west of Monticello, Georgia, on Georgia Highway 16, about 5.1 miles south on a paved county road, 600 feet southwest of the road; USGS Lloyd Shoals Dam topographic quadrangle (1964); lat. 33 degrees 15 minutes 24 seconds N. and long. 83 degrees 45 minutes 47 seconds W.

A—0 to 8 inches; dark brown (7.5YR 3/3) loam; weak fine granular structure; friable; many fine and medium roots; few fine manganese concentrations; strongly acid; clear smooth boundary.
Bt1—8 to 15 inches; reddish brown (5YR 4/4) clay; moderate medium subangular blocky structure; firm, sticky, plastic; few fine roots; many prominent clay films on faces of peds; few fine manganese concentrations; moderately acid; gradual wavy boundary.
Bt2—15 to 26 inches; yellowish red (5YR 4/6) clay; few

fine prominent brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; few fine roots; many prominent clay films on faces of peds; few fine manganese concentrations; slightly acid; gradual wavy boundary.

BC—26 to 33 inches; brown (7.5YR 4/4) clay loam; common medium prominent yellowish red (5YR 4/6) and few fine prominent yellow (10YR 8/6) mottles; weak medium subangular blocky structure; firm; slightly acid; gradual wavy boundary.

C1—33 to 42 inches; mottled yellowish red (5YR 4/6), light olive brown (2.5Y 5/4), and yellow (10YR 8/6) saprolite that crushes to clay loam; massive; friable; slightly acid; gradual wavy boundary.

C2—42 to 60 inches; light olive brown (2.5Y 5/4) saprolite that crushes to clay loam; many fine prominent very pale brown (10YR 8/4) and yellowish red (5YR 4/6) mottles; massive; friable; slightly acid.

Range in Characteristics

Thickness of the solum: 27 to 40 inches
Content of coarse fragments: 0 to 15 percent throughout the profile
Reaction: Strongly acid in the A horizon; moderately acid to slightly acid in the B and C horizons

A horizon:
Thickness—4 to 8 inches
Color—hue of 7.5YR and value and chroma of 3 or 4
Texture—loam

Bt horizon:
Color—hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 4 to 8; yellowish brown or brownish yellow mottles occur in the lower part of horizon in some pedons
Texture—clay

BC horizon:
Color—hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 8; horizon has yellow, yellowish brown, brownish yellow, yellowish red, or red mottles
Texture—sandy clay loam or clay loam

C horizon:
Color—mottled in shades of yellow, brown, red, and gray
Texture—saprolite that crushes to sandy clay loam or clay loam

Molena Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Rapid
Parent material: Old alluvium
Landscape position: Stream terraces
Slope range: 2 to 10 percent
Classification: Mixed, thermic Psammentic Hapludults

Geographically Associated Soils

• Wickham and Red Bay soils, which are fine-loamy and well drained

Typical Pedon

Molena loamy sand, 2 to 10 percent slopes; 10.5 miles south of Monticello, Georgia, on Georgia Highway 83, about 1.9 miles west on a U.S. Forest Service road, 25 feet east of the road; USGS Berner topographic quadrangle (1973); lat. 33 degrees 10 minutes 48 seconds N. and long. 83 degrees 48 minutes 57 seconds W.

A—0 to 10 inches; dark brown (7.5YR 3/3) loamy sand; single grained; loose; common fine and medium roots; strongly acid; clear smooth boundary.

Bt1—10 to 25 inches; dark brown (7.5YR 3/4) loamy sand; weak fine granular structure; very friable; common fine roots; sand grains coated and bridged with clay; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bt2—25 to 42 inches; brown (7.5YR 4/4) loamy sand; weak fine granular structure; very friable; few fine roots; sand grains coated and bridged with clay; few fine flakes of mica; strongly acid; gradual wavy boundary.

C1—42 to 56 inches; strong brown (7.5YR 4/6) sand; single grained; loose; few fine flakes of mica; moderately acid; gradual wavy boundary.

C2—56 to 60 inches; yellowish red (5YR 5/8) sand; single grained; loose; few fine flakes of mica; moderately acid.

Range in Characteristics

Thickness of the solum: 40 to 58 inches
Reaction: Very strongly acid to moderately acid

A horizon:
Thickness—5 to 10 inches
Color—hue of 7.5YR or 10YR, value of 3, and chroma of 2 or 3
Texture—loamy sand

Figure 7.—Profile of Buncombe loamy sand. This excessively drained soil occurs on natural levees on flood plains.

Figure 8.—Profile of Gwinnett sandy loam. The subsoil is dark red and clayey. Rippable bedrock occurs at a depth of 51 to 60 inches.

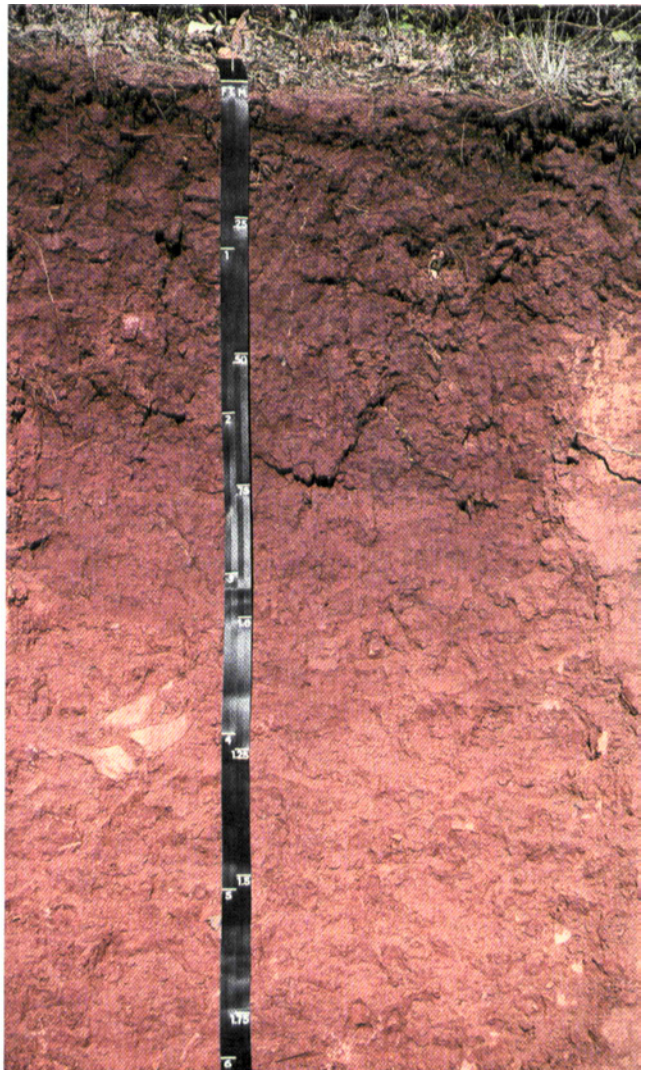

Figure 9.—Profile of Lloyd loam. This well drained soil has a subsoil that is dark red in the upper part and red in the lower part. Bedrock is at a depth of more than 60 inches.

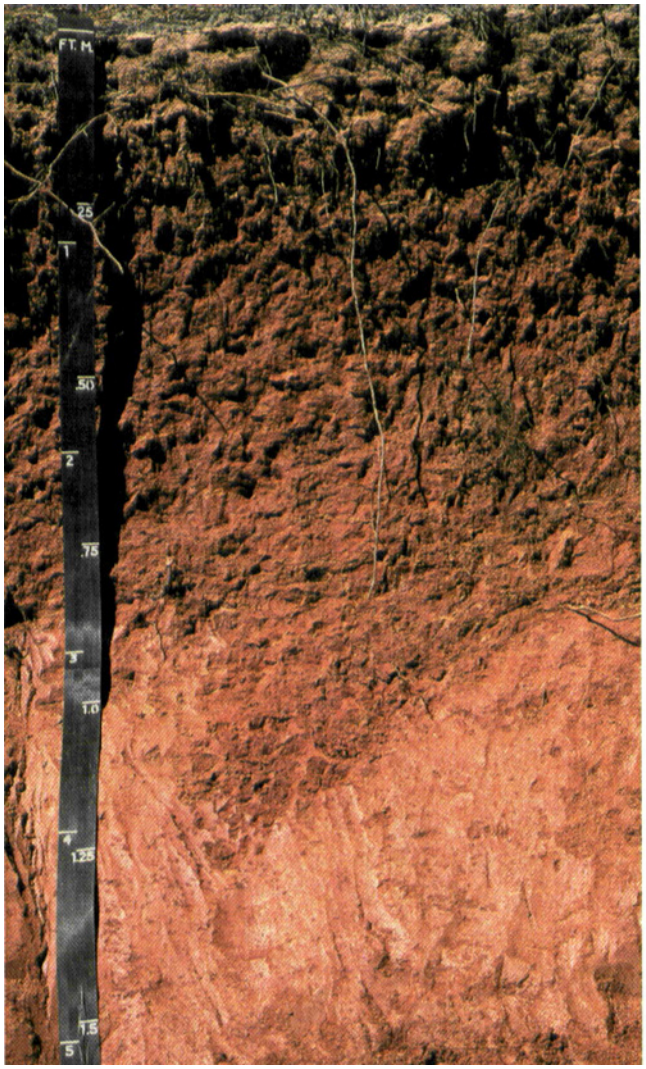

Figure 10.—Profile of Madison sandy loam. This well drained soil has many flakes of mica in the subsoil. Note the wavy boundary between the subsoil and the saprolite.

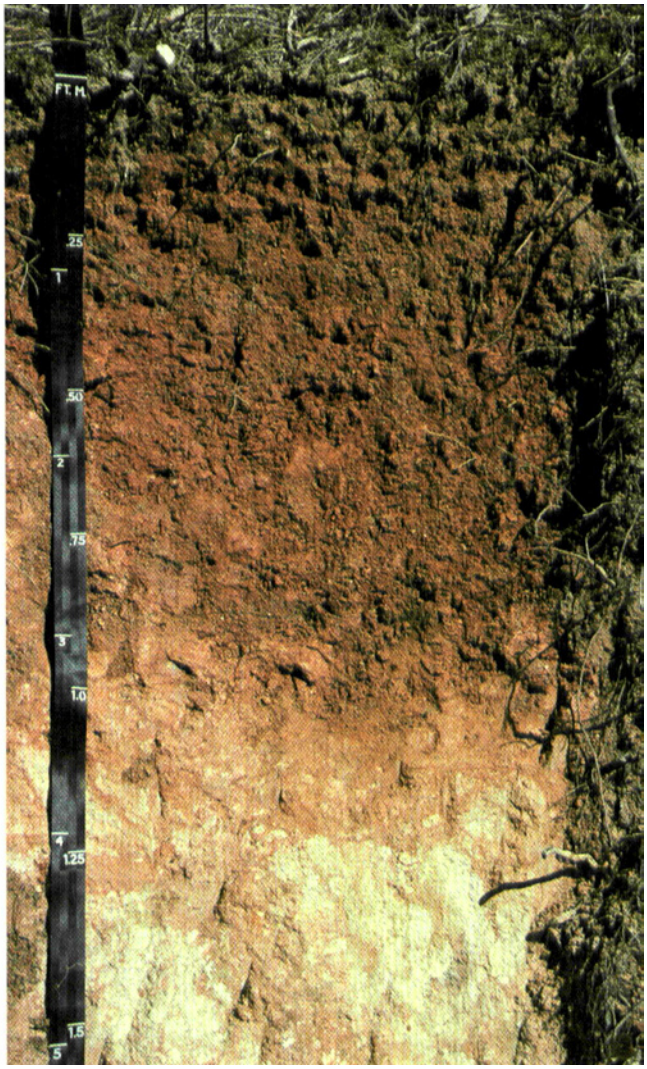

Figure 11.—Profile of Rion sandy loam. This well drained soil has a loamy subsoil that extends to a depth of 25 to 40 inches. Bedrock is at a depth of more than 60 inches.

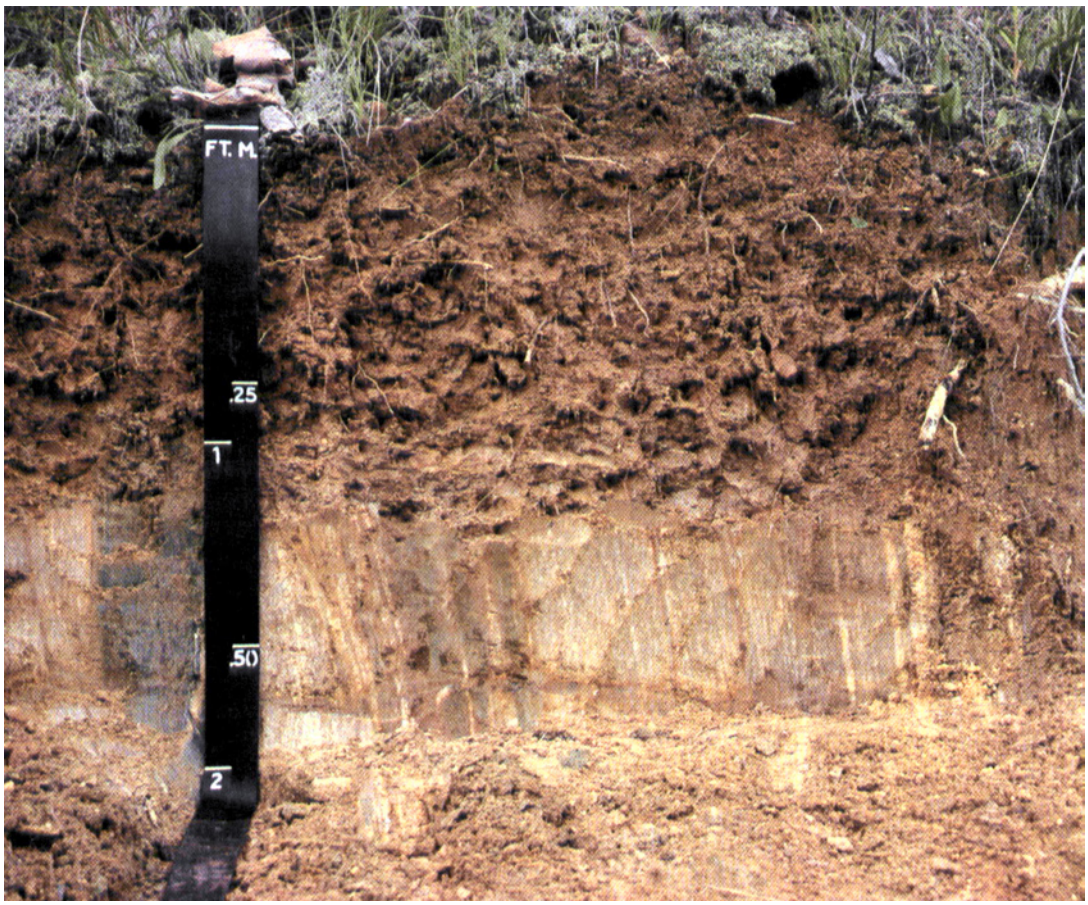

Figure 12.—Profile of Wilkes sandy loam. This well drained soil has a loamy subsoil that is less than 20 inches deep to rippable bedrock.

BE horizon (if it occurs):
Color—hue of 5YR or 7.5YR, value of 4, and chroma of 6
Texture—loamy sand or loamy fine sand

Bt horizon:
Color—hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4 or 6
Texture—loamy sand or loamy fine sand

BC horizon (if it occurs):
Color—hue of 5YR or 7.5YR, value of 5, and chroma of 4 or 6
Texture—loamy sand or loamy fine sand

C horizon:
Color—hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 6 or 8
Texture—sand or loamy sand

Pacolet Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum from acid crystalline rock
Landscape position: Ridges and hillsides
Slope range: 2 to 25 percent
Classification: Fine, kaolinitic, thermic Typic Kanhapludults

Geographically Associated Soils

- Ashlar soils, which have hard bedrock at a depth of 23 to 40 inches
- Cecil soils, which have a solum that is thicker than that of the Pacolet soils
- Gwinnett soils, which have a dark red subsoil
- Madison soils, which have many flakes of mica in the lower part of the solum
- Rion soils, which are in a fine-loamy family
- Wedowee soils, which have a brown subsoil

Typical Pedon

Pacolet sandy loam, 2 to 6 percent slopes; 1,500 feet northwest on Georgia Highway 221 from its intersection with Georgia Highway 211, about 400 feet north of the road; USGS Stewart topographic quadrangle (1964); lat. 33 degrees 23 minutes 13 seconds N. and long. 83 degrees 48 minutes 39 seconds W.

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.
Bt1—7 to 20 inches; red (2.5YR 4/6) sandy clay; weak medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.
Bt2—20 to 25 inches; red (2.5YR 4/6) sandy clay; common medium prominent reddish yellow (5YR 6/8) mottles; weak medium subangular blocky structure; firm; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.
BC—25 to 33 inches; red (2.5YR 4/6) sandy clay loam; common medium prominent yellowish red (5YR 5/6) and pink (5YR 8/4) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; common fine flakes of mica; very strongly acid; gradual wavy boundary.
C1—33 to 54 inches; mottled red (2.5YR 4/6), yellowish red (5YR 4/6), and pink (7.5YR 8/3) saprolite that crushes to sandy clay loam; massive; friable; common fine flakes of mica; very strongly acid; gradual wavy boundary.
C2—54 to 60 inches; mottled red (2.5YR 4/6), yellowish red (5YR 4/6), and very pale brown (10YR 8/4) saprolite that crushes to sandy loam; massive; friable; many fine flakes of mica; very strongly acid.

Range in Characteristics

Thickness of the solum: 24 to 38 inches
Reaction: Very strongly acid or strongly acid, except where the surface layer has been limed

A horizon:
Thickness—4 to 8 inches
Color—hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 to 4
Texture—sandy loam or sandy clay loam

Bt horizon (upper part):
Color—hue of 2.5YR, value of 4, and chroma of 6 or 8
Texture—sandy clay or clay

Bt horizon (lower part):
Color—hue of 2.5YR, value of 4, and chroma of 6 or 8; horizon has mottles in shades of yellow or brown
Texture—sandy clay or clay

BC horizon:
Color—hue of 2.5YR, value of 4, and chroma of 6; horizon is mottled in shades of red, yellow, pink, and white
Texture—sandy clay loam

C horizon:
Color—mottled in shades of red, yellow, brown, pink, and white

Texture—saprolite that crushes to sandy loam or sandy clay loam

Red Bay Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Old alluvium
Landscape position: High terraces
Slope range: 2 to 12 percent
Classification: Fine-loamy, kaolinitic, thermic Rhodic Kandiudults

Geographically Associated Soils

- Molena soils, which are sandier than the Red Bay soils and do not have Rhodic colors
- Lloyd soils, which are clayey and do not have Rhodic colors throughout

Typical Pedon

Red Bay sandy loam, 2 to 5 percent slopes; 9.5 miles south of Monticello, Georgia, on Georgia Highway 83, about 0.7 mile west on a county road, 0.8 mile west on a woodland road, 50 feet north of the road; USGS Berner topographic quadrangle (1973); lat. 33 degrees 11 minutes 37 seconds N. and long. 83 degrees 48 minutes 6 seconds W.

Ap—0 to 8 inches; dusky red (2.5YR 3/2) sandy loam; weak fine granular structure; very friable; common fine and few medium roots; strongly acid; gradual wavy boundary.
Bt1—8 to 22 inches; dark reddish brown (2.5YR 3/4) sandy clay loam that has very dusky red streaks; weak medium subangular blocky structure; very friable; few fine and few medium roots; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.
Bt2—22 to 44 inches; dark reddish brown (2.5YR 3/4) sandy clay loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.
Bt3—44 to 62 inches; dark red (2.5YR 3/6) sandy clay loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid.

Range in Characteristics

Thickness of the solum: More than 60 inches
Reaction: Very strongly acid or strongly acid

A horizon:
Thickness—4 to 8 inches
Color—hue of 2.5YR or 5YR, value of 3, and chroma of 2 or 3
Texture—sandy loam

Bt horizon:
Color—hue of 2.5YR, value of 3, and chroma of 4 or 6
Texture—sandy loam or sandy clay loam

Rion Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum from acid crystalline rock
Landscape position: Hillsides
Slope range: 15 to 40 percent
Classification: Fine-loamy, mixed, semiactive, thermic Typic Hapludults

Geographically Associated Soils

- Ashlar soils, which have hard bedrock at a depth of 23 to 40 inches and do not have an argillic horizon
- Pacolet and Wedowee soils, which have a clayey subsoil

Typical Pedon

Rion sandy loam, 15 to 40 percent slopes; 500 feet north of Murder Creek bridge on Georgia Highway 229, about 2 miles northwest on a county road, 3,000 feet east-northeast of the road; USGS Farrar topographic quadrangle (1972); lat. 33 degrees 26 minutes 16 seconds N. and long. 83 degrees 40 minutes 33 seconds W.

A—0 to 7 inches; strong brown (7.5YR 4/6) sandy loam; weak fine granular structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.
Bt1—7 to 20 inches; yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; very strongly acid; gradual wavy boundary.
Bt2—20 to 36 inches; yellowish red (5YR 4/6) sandy clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.
C—36 to 60 inches; mottled yellowish red (5YR 4/6), strong brown (7.5YR 5/6), and brownish yellow (10YR 6/8) sandy loam; massive; very friable;

common pockets of loamy sand; common weathered fragments of feldspar; very strongly acid.

Range in Characteristics

Thickness of the solum: 25 to 40 inches (fig. 11)
Content of coarse fragments: 0 to 15 percent throughout the profile
Reaction: Very strongly acid or strongly acid

A horizon:
Thickness—4 to 8 inches
Color—hue of 5YR to 10YR, value of 4, and chroma of 3 to 6
Texture—sandy loam

Bt horizon (upper part):
Color—hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8
Texture—sandy clay loam or clay loam

Bt horizon (lower part):
Color—hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8; horizon has mottles in shades of brown
Texture—sandy clay loam

C horizon:
Color—hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8; horizon has mottles in shades of red, brown, or yellow or is mottled in shades of red, brown, and yellow
Texture—loamy sand or sandy loam

Roanoke Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Parent material: Clayey alluvium
High water table: 3.0 feet above the surface to 1.0 foot below
Landscape position: Flood plains
Slope range: 0 to 2 percent
Classification: Fine, mixed, semiactive, thermic Typic Endoaquults

Geographically Associated Soils

- Chewacla soils, which are fine-loamy and somewhat poorly drained
- Shellbluff soils, which are fine-silty and well drained
- Toccoa soils, which are coarse-loamy and well drained and moderately well drained

Typical Pedon

Roanoke silt loam, 0 to 2 percent slopes, frequently flooded; 3.3 miles north of Monticello, Georgia, on Georgia Highway 229 to Lowery Branch, 1,000 feet southeast of the bridge; USGS Monticello topographic quadrangle (1972); lat. 33 degrees 20 minutes 51 seconds N. and long. 83 degrees 41 minutes 14 seconds W.

A—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; friable; common fine roots; strongly acid; clear smooth boundary.
Btg—8 to 42 inches; dark grayish brown (10YR 4/2) silty clay; weak medium subangular blocky structure; firm; strongly acid; gradual wavy boundary.
BCg—42 to 60 inches; dark grayish brown (10YR 4/2) silty clay loam; weak medium subangular blocky structure; friable; strongly acid.

Range in Characteristics

Thickness of the solum: 48 to 60 inches
Reaction: Very strongly acid or strongly acid in the solum; strongly acid to slightly acid in the Cg horizon

A horizon:
Thickness—3 to 9 inches
Color—hue of 10YR, value of 3 to 6, and chroma of 2
Texture—silt loam

Btg horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 1 or 2; mottles in shades of red, yellow, or brown occur in some pedons
Texture—silty clay or clay

BCg horizon (if it occurs):
Color—hue of 10YR, value of 4 to 6, and chroma of 1 or 2; mottles in shades of red, yellow, or brown occur in some pedons
Texture—silty clay loam, silty clay, or clay

Cg horizon (if it occurs):
Color—hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 0 to 2
Texture—sandy clay loam or clay

Shellbluff Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate

Parent material: Fluvial sediments
Depth to high water table: 3.0 to 5.0 feet
Landscape position: Flood plains
Slope range: 0 to 2 percent
Classification: Fine-silty, mixed, semiactive, thermic Fluventic Dystrochrepts

Geographically Associated Soils

- Buncombe soils, which are sandy and excessively drained
- Chewacla soils, which are fine-loamy and somewhat poorly drained
- Roanoke soils, which are clayey and poorly drained
- Toccoa soils, which are coarse-loamy and well drained and moderately well drained

Typical Pedon

Shellbluff loam, 0 to 2 percent slopes, occasionally flooded; 10.5 miles south of Monticello, Georgia, on Georgia Highway 83, about 1.8 miles west on a U.S. Forest Service road, 530 feet west-northwest of the road; USGS Berner topographic quadrangle (1973); lat. 33 degrees 11 minutes 6 seconds N. and long. 83 degrees 49 minutes 2 seconds W.

A1—0 to 6 inches; brown (7.5YR 4/4) loam; weak fine granular structure; very friable; common fine and medium roots; few fine flakes of mica; moderately acid; clear smooth boundary.
A2—6 to 10 inches; brown (7.5YR 4/2) silt loam; weak medium granular structure; friable; few fine and medium roots; few fine flakes of mica; moderately acid; clear smooth boundary.
Bw1—10 to 16 inches; brown (7.5YR 4/4) silty clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; common distinct silt coatings on faces of peds; few fine flakes of mica; few fine manganese concretions; moderately acid; clear smooth boundary.
Bw2—16 to 55 inches; brown (7.5YR 5/4) silty clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; common distinct silt coatings on faces of peds; few fine flakes of mica; moderately acid; gradual wavy boundary.
BC—55 to 60 inches; brown (7.5YR 5/4) silt loam; common fine distinct light yellowish brown (10YR 6/4) mottles; weak fine subangular blocky structure; friable; few fine roots; few fine flakes of mica; moderately acid.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Reaction: Strongly acid or moderately acid
Depth to mottles with chroma of 2 or less: 35 inches or more

A horizon:
Thickness—5 to 10 inches
Color—hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4
Texture—loam

Bw horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4
Texture—silt loam or silty clay loam

BC horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6; horizon has mottles in shades of brown
Texture—silt loam

C horizon (if it occurs):
Color—hue of 10YR, value of 4 or 5, and chroma of 4 to 6; horizon has mottles in shades of brown
Texture—loam or silt loam

Toccoa Series

Depth class: Very deep
Drainage class: Moderately well drained and well drained
Permeability: Moderately rapid
Parent material: Alluvium
Depth to high water table: 2.5 to 5.0 feet
Landscape position: Flood plains
Slope range: 0 to 3 percent
Classification: Coarse-loamy, mixed, semiactive, nonacid, thermic Typic Udifluvents

Geographically Associated Soils

- Buncombe soils, which are sandy throughout
- Chewacla soils, which are fine-loamy and have gray mottles within a depth of 24 inches
- Roanoke soils, which are poorly drained
- Shellbluff soils, which are fine-silty

Typical Pedon

Toccoa fine sandy loam, 0 to 3 percent slopes, frequently flooded; 4.5 miles northwest of Monticello, Georgia, on Georgia Highway 212, about 1.3 miles southwest on a county road, 200 feet north-northwest of the road; USGS Lloyd Shoals Dam topographic quadrangle (1964); lat. 33 degrees 21 minutes 50

seconds N. and long. 83 degrees 48 minutes 54 seconds W.

A—0 to 4 inches; brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; many fine flakes of mica; strongly acid; clear smooth boundary.
C1—4 to 22 inches; strong brown (7.5YR 4/6) sandy loam; massive; very friable; few medium roots; many fine flakes of mica; strongly acid; gradual wavy boundary.
C2—22 to 35 inches; yellowish red (5YR 4/6) sandy loam; massive; very friable; few fine and medium roots; many fine flakes of mica; strongly acid; gradual wavy boundary.
C3—35 to 43 inches; yellowish red (5YR 4/6) loamy sand that has thin strata of strong brown (7.5YR 4/6) loam; massive; very friable; many fine flakes of mica; moderately acid; clear wavy boundary.
C4—43 to 57 inches; yellowish red (5YR 4/6) sandy loam; massive; very friable; moderately acid; clear wavy boundary.
C5—57 to 60 inches; mottled strong brown (7.5YR 4/6), brown (10YR 5/3), and dark yellowish brown (10YR 4/4) loam; massive; friable; strongly acid.

Range in Characteristics

Depth to mottles with chroma of 2 or less (if they occur): More than 40 inches
Reaction: Strongly acid to slightly acid; moderately acid or slightly acid in some subhorizon between a depth of 10 and 40 inches
Distinctive features: Bedding planes and thin strata of sandy or loamy textures that occur throughout the C horizon

A horizon:
Thickness—4 to 8 inches
Color—hue of 7.5YR or 10YR, value of 4, and chroma of 3 or 4
Texture—fine sandy loam

C horizon (upper part):
Color—hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
Texture—fine sandy loam or sandy loam; thin horizons of loamy sand may occur

C horizon (lower part):
Color—hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8; horizon has mottles in shades of brown
Texture—fine sandy loam, sandy loam, or loam; thin horizons of sand or loamy sand may occur

Wedowee Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum from acid crystalline rock
Landscape position: Ridges and hillsides
Slope range: 2 to 30 percent
Classification: Fine, kaolinitic, thermic Typic Kanhapludults

Geographically Associated Soils

- Ashlar soils, which have hard bedrock at a depth of 23 to 40 inches and do not have an argillic horizon
- Pacolet soils, which have a red subsoil
- Rion soils, which are in a fine-loamy family

Typical Pedon

Wedowee sandy loam, 6 to 15 percent slopes; 3,300 feet northwest of Shady Dale, Georgia, on Georgia Highway 142, about 2,500 feet northeast of the road; USGS Shady Dale topographic quadrangle (1972); lat. 33 degrees 24 minutes 10 seconds N. and long. 83 degrees 35 minutes 33 seconds W.

A—0 to 5 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; very friable; very strongly acid; clear smooth boundary.
Bt1—5 to 18 inches; yellowish red (5YR 5/8) sandy clay; common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; very strongly acid; gradual wavy boundary.
Bt2—18 to 25 inches; yellowish red (5YR 5/8) sandy clay; common medium prominent reddish yellow (7.5YR 8/6) and red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; very strongly acid; gradual wavy boundary.
BC—25 to 32 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/6) and very pale brown (10YR 8/4) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.
C—32 to 60 inches; mottled red (2.5YR 4/6), yellowish brown (10YR 5/8), and very pale brown (10YR 8/2) saprolite that crushes to sandy clay loam and sandy clay; massive; friable; very strongly acid.

Range in Characteristics

Thickness of the solum: 32 to 38 inches

Content of coarse fragments: 0 to 35 percent in the A and E horizons in some pedons
Reaction: Very strongly acid or strongly acid

A horizon:
Thickness—4 to 5 inches
Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 or 4
Texture—sandy loam or gravelly sandy loam

E horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6
Texture—sandy loam or gravelly sandy loam

Bt horizon (upper part):
Color—hue of 5YR to 10YR, value of 4 to 6, and chroma of 6 to 8; strong brown mottles occur in some pedons
Texture—sandy clay loam, sandy clay, or clay

Bt horizon (lower part):
Color—hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 6 or 8; mottles in shades of red, yellow, or brown occur in some pedons
Texture—sandy clay or clay

C horizon:
Color—mottled in shades of yellow, brown, and red
Texture—saprolite that crushes to sandy loam, sandy clay loam, or sandy clay

Wickham Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Old loamy alluvium
Landscape position: Stream terraces
Slope range: 0 to 4 percent
Classification: Fine-loamy, mixed, semiactive, thermic Typic Hapludults

Geographically Associated Soils

- Altavista soils, which have gray mottles within 24 inches of the top of the argillic horizon
- Molena soils, which are sandier than the Wickham soils

Typical Pedon

Wickham sandy loam, 0 to 4 percent slopes, rarely flooded; 10.5 miles south of Monticello, Georgia, on Georgia Highway 83, about 1.8 miles west on a U.S. Forest Service road, 100 feet northwest of the road; USGS Berner topographic quadrangle (1973); lat. 33 degrees 11 minutes 2 seconds N. and long. 83 degrees 48 minutes 55 seconds W.

A—0 to 7 inches; yellowish red (5YR 4/6) sandy loam; weak fine granular structure; very friable; many fine roots; few fine flakes of mica; moderately acid; clear smooth boundary.
Bt1—7 to 21 inches; reddish brown (5YR 4/4) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.
Bt2—21 to 40 inches; yellowish red (5YR 4/6) sandy clay loam; weak fine subangular blocky structure; very friable; few fine roots; few faint clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.
C1—40 to 52 inches; yellowish red (5YR 4/6) sandy loam; massive; very friable; few fine flakes of mica; very strongly acid; gradual wavy boundary.
C2—52 to 60 inches; yellowish red (5YR 5/6) loamy sand; massive; very friable; few fine flakes of mica; very strongly acid.

Range in Characteristics

Thickness of the solum: 38 to 60 inches
Reaction: Very strongly acid to moderately acid

A horizon:
Thickness—4 to 7 inches
Color—hue of 5YR to 10YR, value of 4, and chroma of 2 to 6
Texture—sandy loam

Bt horizon:
Color—hue of 5YR or 7.5YR, value of 4, and chroma of 4 or 6; red and strong brown mottles occur in the lower part of horizon in some pedons
Texture—sandy clay loam, clay loam, or loam

BC horizon (if it occurs):
Color—hue of 5YR or 7.5YR, value of 5, and chroma of 6 or 8; horizon has pale brown and yellowish brown mottles
Texture—sandy loam or loam

C horizon:
Color—hue of 5YR to 10YR, value of 5 or 6, and chroma of 3 to 8; horizon has reddish yellow and pale brown mottles
Texture—sandy loam or loamy sand

Wilkes Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately slow
Parent material: Residuum from basic crystalline rock
Landscape position: Narrow ridges and hillsides
Slope range: 6 to 35 percent
Classification: Loamy, mixed, active, thermic, shallow Typic Hapludalfs

Geographically Associated Soils

- Madison soils, which are very deep and are in a clayey family
- Zion soils, which are moderately deep

Typical Pedon

Wilkes sandy loam in an area of Wilkes-Zion complex, 6 to 15 percent slopes; 10.5 miles southwest of Monticello, Georgia, on Georgia Highway 83, about 1.0 mile west on a U.S. Forest Service road, 20 feet southwest of the road; USGS Berner topographic quadrangle (1973); lat. 33 degrees 10 minutes 50 seconds N. and long. 83 degrees 48 minutes 22 seconds W.

A—0 to 3 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine and few medium roots; few fine flakes of mica; strongly acid; abrupt smooth boundary.

E—3 to 6 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; common fine and few medium roots; few fine flakes of mica; strongly acid; abrupt smooth boundary.

Bt—6 to 10 inches; dark yellowish brown (10YR 4/6) sandy clay loam; moderate medium subangular blocky structure; firm; common very fine, common fine, and few medium roots; few distinct clay films on faces of peds; many fine and medium flakes of mica; moderately acid; clear wavy boundary.

BC—10 to 18 inches; dark yellowish brown (10YR 4/6) sandy clay loam; few fine prominent yellow (10YR 7/6) and yellowish red (5YR 5/8) mottles; few seams of clay material; weak medium subangular blocky structure; firm; few medium roots; few distinct clay films on faces of peds; many fine and medium flakes of mica; slightly acid; clear wavy boundary.

Cr—18 to 45 inches; greenish black, yellowish brown, and gray weathered bedrock that crushes to sandy loam; few medium roots in the upper part of horizon; common fine flakes of mica; slightly acid; clear wavy boundary.

R—45 inches; hard bedrock.

Range in Characteristics

Thickness of the solum: 10 to 18 inches
Depth to soft bedrock: 15 to 20 inches (fig. 12)
Depth to hard bedrock: 43 to 47 inches
Content of coarse fragments: 0 to 15 percent throughout the profile
Reaction: Strongly acid to slightly acid in the upper horizons; moderately acid to slightly acid in the lower horizons

A horizon:
Thickness—3 to 5 inches
Color—hue of 10YR, value of 3 or 4, and chroma of 2 or 3
Texture—sandy loam

E horizon (if it occurs):
Color—hue of 10YR, value of 5, and chroma of 4
Texture—sandy loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6
Texture—sandy clay loam, clay loam, or clay; weighted average content of clay in the control section is 18 to 35 percent

BC horizon (if it occurs):
Color—hue of 10YR, value of 4, and chroma of 6; horizon has yellowish red and yellow mottles or is mottled in shades of brown and red
Texture—sandy clay loam

C horizon (if it occurs):
Color—mottled in shades of brown and olive
Texture—saprolite that crushes to sandy loam

Cr horizon:
Color—mottled in shades of black, brown, and gray
Texture—weathered bedrock

Wynott Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Parent material: Residuum from gabbro and diorite
Landscape position: Hillsides
Slope range: 15 to 35 percent
Classification: Fine, mixed, active, thermic Typic Hapludalfs

Geographically Associated Soils

- Madison soils, which are very deep and are in a clayey family

- Wilkes soils, which are shallow
- Zion soils, which have hard bedrock between depths of 33 and 40 inches

Typical Pedon

Wynott sandy loam in an area of Wynott-Zion-Wilkes complex, 15 to 35 percent slopes; 9.5 miles south of Monticello, Georgia, on Georgia Highway 83, about 3.7 miles south on Juliette Road, 1,300 feet northeast on a U.S. Government road, 50 feet south of the road; USGS Berner topographic quadrangle (1973); lat. 33 degrees 9 minutes 13 seconds N. and long. 83 degrees 47 minutes 52 seconds W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) sandy loam; weak fine granular structure; friable; many fine and few medium roots; strongly acid; clear smooth boundary.

E—5 to 9 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; friable; common fine and few medium roots; moderately acid; gradual wavy boundary.

Bt—9 to 17 inches; dark yellowish brown (10YR 4/6) clay; moderate medium subangular blocky structure; very firm, sticky, plastic; few fine roots; common prominent clay films on faces of peds; common fine flakes of mica; moderately acid; gradual wavy boundary.

BC—17 to 23 inches; dark yellowish brown (10YR 4/6) sandy clay; common medium distinct brown (10YR 5/3) mottles; very firm, sticky, plastic; few distinct clay films on faces of peds; common fine flakes of mica; slightly acid; gradual wavy boundary.

C—23 to 37 inches; mottled dark yellowish brown (10YR 4/6), pale brown (10YR 6/3), and black (10YR 2/1) saprolite that crushes to sandy loam; massive; very friable; many fine flakes of mica; slightly acid; clear wavy boundary.

Cr—37 to 60 inches; greenish black, brown, and gray weathered bedrock.

Range in Characteristics

Thickness of the solum: 21 to 40 inches
Depth to soft bedrock: 37 to 40 inches
Depth to hard bedrock: 55 to more than 60 inches
Content of coarse fragments: 0 to 15 percent
Reaction: Strongly acid to slightly acid

A horizon:
Thickness—3 to 5 inches
Color—hue of 10YR, value of 3, and chroma of 2 or 3
Texture—sandy loam

E horizon (if it occurs):
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—sandy loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8
Texture—clay

BC horizon (if it occurs):
Color—hue of 10YR, value of 4, and chroma of 6; horizon has mottles in shades of brown
Texture—sandy clay

C horizon:
Color—mottled in shades of brown, yellow, and black
Texture—saprolite that crushes to sandy loam or sandy clay loam

Cr horizon:
Color—multicolored
Texture—weathered bedrock

Zion Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow and slow
Parent material: Residuum from gabbro and diorite
Landscape position: Hillsides
Slope range: 6 to 35 percent
Classification: Fine, mixed, active, thermic Ultic Hapludalfs

Geographically Associated Soils

- Madison soils, which are very deep and are Ultisols
- Mecklenburg soils, which are very deep
- Wilkes soils, which are shallow
- Wynott soils, which have hard bedrock at a depth of 40 to more than 60 inches

Typical Pedon

Zion sandy loam in an area of Wynott-Zion-Wilkes complex, 15 to 35 percent slopes; 5.2 miles south of Monticello, Georgia, on Georgia Highway 83, about 3,300 feet west on Mount Olive Church Road, 600 feet west on a woodland road, 20 feet north of the road; USGS Berner topographic quadrangle (1973); lat. 33 degrees 13 minutes 27 seconds N. and long. 83 degrees 46 minutes 47 seconds W.

A—0 to 6 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine,

many very fine, and few coarse roots; 8 percent coarse fragments; strongly acid; clear smooth boundary.

Bt—6 to 16 inches; yellowish red (5YR 4/6) clay; few medium distinct strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; very firm, very sticky; few fine and medium roots; common distinct clay films on faces of peds; common fine black concretions; moderately acid; gradual wavy boundary.

BC—16 to 25 inches; yellowish red (5YR 4/6) clay loam; common medium prominent red (2.5YR 5/6) mottles; weak medium angular blocky structure; very firm, very sticky; few fine and medium roots; few faint clay films on faces of peds; moderately acid; gradual wavy boundary.

C—25 to 28 inches; mottled dark yellowish brown (10YR 4/6), yellowish brown (10YR 5/8), and pale brown (10YR 6/3) saprolite that crushes to sandy loam; massive; friable; common fine flakes of mica; slightly acid; clear wavy boundary.

Cr—28 to 33 inches; multicolored weathered bedrock.

R—33 inches; hard mafic bedrock.

Range in Characteristics

Thickness of the solum: 20 to 30 inches

Depth to hard bedrock: 33 to 40 inches

Reaction: Strongly acid or moderately acid in the upper part of the solum; strongly acid to neutral in the lower part of the solum and in the substratum

A horizon:

Thickness—3 to 6 inches

Color—hue of 10YR, value of 3 or 4, and chroma of 2 to 4

Texture—sandy loam

Bt horizon:

Color—hue of 5YR or 7.5YR, value of 4, and chroma of 6; mottles in shades of brown or red occur in some pedons

Texture—clay

BC horizon (if it occurs):

Color—hue of 5YR, value of 4, and chroma of 6; horizon has red mottles

Texture—clay loam

C horizon:

Color—mottled in shades of yellow, gray, white, and brown

Texture—saprolite that crushes to sandy loam, sandy clay loam, or sandy clay

Cr horizon (if it occurs):

Color—multicolored

Texture—weathered bedrock

Formation of the Soils

This section describes the factors of soil formation and relates them to the soils in the survey area. It also discusses the geology of the survey area.

Factors of Soil Formation

Soil characteristics are determined by the physical and mineralogical composition of the parent material; the plants and animals living on and in the soil; the climate under which the parent material accumulated and has existed since accumulation; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the soil material *(3)*. All of these factors influence every soil, but the significance of each factor varies from place to place. In one area, one factor may dominate soil formation; in another area, a different factor may dominate.

The interrelationships among the soil-forming factors are complex, and the effects of any one factor cannot be isolated and completely evaluated. It is convenient, however, to describe each factor separately and to indicate the probable effects of each.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. The chemical and mineralogical composition of the soil is derived largely from the parent material. The soils in Jasper County formed mainly from materials weathered from crystalline rock, such as granitic gneiss, intermediate gneiss, amphibolites, mica schist, gabbro, and basic hornfels *(6)*.

Appling, Cecil, Pacolet, and Wedowee soils are examples of soils that have a red or yellowish brown subsoil and formed in parent material weathered mainly from granite gneiss or intermediate gneiss. Madison soils have a high content of mica and weathered mainly from mica schist. Gwinnett and Lloyd soils are examples of soils that have a dark surface layer and subsoil and formed in parent material weathered mainly from amphibolites and hornblende gneiss or the intermediate gneiss. Iredell and Wilkes soils are examples of soils that have a firm, sticky, and plastic subsoil and formed in parent material which weathered mainly from gabbro and basic hornfels.

Stream alluvium is adjacent to all the streams in Jasper County. It includes sandy, loamy, and clayey sediment transported from the uplands. Chewacla, Roanoke, and Toccoa soils formed in stream alluvium.

Stream terraces are near some of the larger streams and rivers in the county. The soils on these terraces formed in alluvium that is younger than the parent material of upland soils but older than the alluvium on adjacent flood plains. Altavista, Molena, and Wickham soils formed in alluvium on stream terraces.

Plants and Animals

The effects of plants, animals, and other organisms on soil formation are significant. Plants and animals increase the content of organic matter and nitrogen in the soil, increase or decrease the content of plant nutrients, and change soil structure and porosity.

Plants recycle nutrients, add organic matter, and provide food and cover for animals. They stabilize the surface layer so that the soil-forming processes can continue. They also provide a more stable environment for the soil-forming processes by protecting the soils from extremes in temperature.

The soils in Jasper County formed under a succession of briers, brambles, and woody plants that were dominated by pines and hardwoods. Hardwoods eventually suppressed most other plants and became the climax vegetation.

Animals rearrange the soil material by roughening the surface, forming and filling channels, and shaping the peds and voids. The soil is mixed by ants, wasps, worms, and spiders, which make channels; by crustacea, such as crayfish; and by turtles and foxes, which dig burrows. Humans affect the soil-forming processes by tilling crops, removing natural vegetation and establishing different plants, and reducing or increasing the level of fertility.

Bacteria, fungi, and other micro-organisms hasten the decomposition of organic matter and increase the rate at which nutrients are released for plant growth.

The net gains and losses caused by plants and animals are important in Jasper County. Within the relatively small confines of the survey area, however, one soil is not significantly different from another because of the effects of plants and animals.

Climate

The present climate of Jasper County is probably similar to the climate that existed when the soils formed. The relatively high amount of rainfall and warm temperatures contribute to rapid soil formation. They are the two most important climatic features that relate to soil properties.

Water from precipitation is essential in the formation of soil. Water dissolves soluble materials and is used by plants and animals. It transports material from one part of the soil to another part and from one area of the landscape to another.

The soils in Jasper County formed under a thermic temperature regime—that is, the mean soil temperature at a depth of 20 inches is 59 to 72 degrees F. Based on the mean annual air temperature, the estimated soil temperature in Jasper County is 64 degrees F. The rate of chemical reactions and other processes in the soil depends to some extent on temperature. In addition, temperature affects the type and quality of vegetation, the amount and kind of organic matter, and the rate at which the organic matter decomposes.

Relief

Relief is the elevations, or inequalities, of the land surface considered collectively. The color of the soil, the degree of wetness, the thickness of the A horizon, the content of organic matter, and the plant cover are commonly related to relief. In Jasper County, the most obvious effects of relief are those that relate to soil color and the degree of soil wetness.

Most Lloyd soils have a dark reddish subsoil, whereas Roanoke soils have a grayish brown subsoil. The difference in color results from a difference in relief and a corresponding difference in internal drainage. Because Lloyd soils are in the higher landscape positions and are better drained than Roanoke soils, Lloyd soils are better oxidized and have a reddish subsoil.

The movement of water across the surface and through the soil is controlled mostly by relief. Water flowing across the surface commonly carries solid particles and causes erosion or deposition, depending on the kind of relief. In the sloping areas, the soils are drier because more water runs off and less water penetrates the surface. The soils in low-lying areas are commonly wetter because they receive the water that flows off and through the soils in the higher landscape positions.

Time

The length of time that the soil-forming processes have acted on the parent material helps to determine the characteristics of the soil. Determinations of when soil formation began in the survey area are not exact. Most of the soils are considered mature. Mature soils are in equilibrium with the environment. They are characterized by readily recognizable pedogenic horizons and a regular decrease in carbon content with increasing depth. Some areas of Lloyd soils are on stable landscapes where the soil-forming processes have been active for thousands of years. These mature soils have a highly weathered solum and a well expressed zone of illuviation. In places erosion has removed most of the zone of eluviation.

Toccoa soils are young soils. They receive sediment annually from floodwater. They are stratified and are not old enough to have a zone of illuviation. They do not have pedogenic horizons. They are characterized by an irregular decrease in carbon content with increasing depth.

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Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Control section. The part of the soil on which

classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.* These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Exposed material is hard or soft bedrock. Areas identified on the detailed soil maps by a special symbol typically are long, narrow bands that are less than 2 acres in size. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A very small channel with steep sides cut by running water and through which water ordinarily runs only after rainfall, icemelt, or snowmelt. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or

lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly

nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments ranging from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 6 percent
Sloping	6 to 10 percent
Strongly sloping	10 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 40 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth

from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Tables

Table 1.—Temperature and Precipitation

(Recorded in the period 1961-90 at Monticello, Georgia)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	53.4	32.7	43.0	75	6	49	4.45	2.63	6.08	7	0.1
February----	58.1	34.8	46.4	78	14	69	4.70	2.57	6.58	6	.5
March-------	67.1	42.4	54.7	85	23	201	5.47	2.91	7.72	6	.1
April-------	75.2	50.4	62.8	90	33	391	3.84	1.75	5.64	5	.0
May---------	81.6	58.3	70.0	93	42	619	4.13	2.25	5.78	5	.0
June--------	87.9	65.8	76.8	99	53	805	3.53	1.52	5.25	6	.0
July--------	90.4	69.1	79.8	100	60	922	4.33	2.13	6.24	6	.0
August------	89.5	68.6	79.0	99	59	901	4.19	2.23	5.90	5	.0
September---	84.6	63.2	73.9	96	47	714	2.87	1.39	4.32	4	.0
October-----	75.5	51.3	63.4	89	33	416	2.92	1.39	4.62	4	.0
November----	66.5	42.8	54.7	82	23	189	3.18	1.69	4.48	5	.0
December----	57.4	35.4	46.4	77	12	69	4.12	2.29	5.73	6	.0
Yearly:											
Average---	73.9	51.2	62.6	---	---	---	---	---	---	---	---
Extreme---	103	-7	---	101	4	---	---	---	---	---	---
Total-----	---	---	---	---	---	5,345	47.72	38.17	53.88	65	.8

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.—Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Monticello, Georgia)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Mar. 12	Mar. 22	Apr. 9
2 years in 10 later than--	Mar. 4	Mar. 14	Apr. 3
5 years in 10 later than--	Feb. 18	Feb. 28	Mar. 23
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 21	Nov. 3	Oct. 29
2 years in 10 earlier than--	Nov. 28	Nov. 10	Nov. 3
5 years in 10 earlier than--	Dec. 13	Nov. 24	Nov. 13

Table 3.—Growing Season

(Recorded in the period 1961-90 at Monticello, Georgia)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	259	231	209
8 years in 10	272	243	217
5 years in 10	297	268	233
2 years in 10	321	292	248
1 year in 10	334	305	256

Table 4.—Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AkA	Altavista sandy loam, 0 to 3 percent slopes, rarely flooded	165	0.1
AmB	Appling sandy loam, 2 to 6 percent slopes	1,135	0.5
ApD	Ashlar-Pacolet complex, 2 to 15 percent slopes	925	0.4
ApE	Ashlar-Pacolet complex, 15 to 25 percent slopes	1,420	0.6
BwB	Buncombe loamy sand, 0 to 6 percent slopes, occasionally flooded	465	0.2
CeB	Cecil sandy loam, 2 to 6 percent slopes	7,030	2.9
CeC	Cecil sandy loam, 6 to 10 percent slopes	2,895	1.2
CfB2	Cecil sandy clay loam, 2 to 6 percent slopes, eroded	5,015	2.1
CfC2	Cecil sandy clay loam, 6 to 10 percent slopes, eroded	6,850	2.9
ChA	Chewacla silt loam, 0 to 2 percent slopes, frequently flooded	15,995	6.8
Cr	Chewacla-Roanoke complex, 0 to 1 percent slopes, ponded	950	0.4
GeD	Gwinnett sandy loam, 6 to 15 percent slopes	1,700	0.7
GeE	Gwinnett sandy loam, 15 to 25 percent slopes	1,430	0.6
GwD2	Gwinnett sandy clay loam, 6 to 15 percent slopes, eroded	10,085	4.2
GwE2	Gwinnett sandy clay loam, 15 to 25 percent slopes, eroded	4,915	2.1
IrB	Iredell fine sandy loam, 0 to 6 percent slopes	2,685	1.1
IrC	Iredell fine sandy loam, 6 to 10 percent slopes	335	0.1
LdB	Lloyd loam, 2 to 6 percent slopes	14,435	6.0
LdC	Lloyd loam, 6 to 10 percent slopes	4,365	1.8
LfB2	Lloyd clay loam, 2 to 6 percent slopes, eroded	16,215	6.8
LfD2	Lloyd clay loam, 6 to 15 percent slopes, eroded	34,465	14.4
LfE2	Lloyd clay loam, 15 to 30 percent slopes, eroded	3,590	1.5
LuC	Lloyd-Urban land complex, 2 to 10 percent slopes	1,090	0.5
MaD	Madison sandy loam, 6 to 15 percent slopes	710	0.3
MaE	Madison sandy loam, 15 to 30 percent slopes	1,445	0.6
MdD2	Madison sandy clay loam, 6 to 15 percent slopes, eroded	7,595	3.2
MdE2	Madison sandy clay loam, 15 to 30 percent slopes, eroded	4,710	2.0
MeB	Mecklenburg loam, 2 to 6 percent slopes	615	0.3
MeC	Mecklenburg loam, 6 to 10 percent slopes	2,545	1.1
MoC	Molena loamy sand, 2 to 10 percent slopes	495	0.2
PaB	Pacolet sandy loam, 2 to 6 percent slopes	3,550	1.5
PaD	Pacolet sandy loam, 6 to 15 percent slopes	8,420	3.5
PaE	Pacolet sandy loam, 15 to 25 percent slopes	10,050	4.2
PfB2	Pacolet sandy clay loam, 2 to 6 percent slopes, eroded	2,870	1.2
PfD2	Pacolet sandy clay loam, 6 to 15 percent slopes, eroded	31,095	13.0
PfE2	Pacolet sandy clay loam, 15 to 25 percent slopes, eroded	7,030	2.9
PgE	Pacolet-Urban land complex, 10 to 25 percent slopes	290	0.1
Pt	Pits, quarry	540	0.2
RbB	Red Bay sandy loam, 2 to 5 percent slopes	210	0.1
RbC	Red Bay sandy loam, 5 to 12 percent slopes	165	0.1
ReF	Rion sandy loam, 15 to 40 percent slopes	890	0.4
Rk	Roanoke silt loam, 0 to 2 percent slopes, frequently flooded	345	0.1
Sh	Shellbluff loam, 0 to 2 percent slopes, occasionally flooded	180	0.1
ToA	Toccoa fine sandy loam, 0 to 3 percent slopes, frequently flooded	1,750	0.6
WeB	Wedowee sandy loam, 2 to 6 percent slopes	450	0.2
WeD	Wedowee sandy loam, 6 to 15 percent slopes	1,535	0.6
WeE	Wedowee sandy loam, 15 to 25 percent slopes	330	0.1
WgE	Wedowee gravelly sandy loam, 10 to 30 percent slopes, very stony	260	0.1
WhB	Wickham sandy loam, 0 to 4 percent slopes, rarely flooded	75	*
WkD	Wilkes-Zion complex, 6 to 15 percent slopes	4,595	1.9
WzF	Wynott-Zion-Wilkes complex, 15 to 35 percent slopes	6,800	2.8
	Water	1,540	0.6
	Total	239,200	100.0

* Less than 0.1 percent.

Table 5.—Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Wheat	Pasture
		Bu	Bu	AUM*
AkA Altavista	IIw	100	55	9.0
AmB Appling	IIe	80	45	8.0
ApD: Ashlar	IVe	---	---	4.0
Pacolet	IIIe	70	30	7.5
ApE: Ashlar	VIe	---	---	3.0
Pacolet	VIe	---	---	5.0
BwB Buncombe	IVw	40	---	3.0
CeB Cecil	IIe	75	45	8.0
CeC Cecil	IIIe	60	40	7.5
CfB2 Cecil	IIIe	70	40	5.5
CfC2 Cecil	IVe	50	20	5.0
ChA Chewacla	IVw	80	30	9.0
Cr Chewacla-Roanoke	VIIw	---	---	---
GeD Gwinnett	IVe	45	20	6.5
GeE Gwinnett	VIe	---	---	5.0
GwD2 Gwinnett	VIe	---	---	4.5
GwE2 Gwinnett	VIe	---	---	4.0
IrB Iredell	IIe	50	---	7.0
IrC Iredell	IIIe	45	---	6.5

See footnotes at end of table.

Table 5.—Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Wheat	Pasture
		Bu	Bu	AUM*
LdB---------- Lloyd	IIe	90	50	8.5
LdC---------- Lloyd	IIIe	80	45	8.0
LfB2---------- Lloyd	IIIe	80	45	8.0
LfD2---------- Lloyd	IVe	70	40	7.5
LfE2---------- Lloyd	VIIe	---	---	7.0
LuC**. Lloyd-Urban land				
MaD---------- Madison	IVe	50	35	6.5
MaE---------- Madison	VIIe	---	---	6.0
MdD2---------- Madison	VIe	45	---	5.5
MdE2---------- Madison	VIIe	---	---	4.5
MeB---------- Mecklenburg	IIe	70	40	7.5
MeC---------- Mecklenburg	IIIe	60	35	7.0
MoC---------- Molena	IVs	50	25	7.0
PaB---------- Pacolet	IIe	80	40	8.0
PaD---------- Pacolet	IVe	65	25	7.5
PaE---------- Pacolet	VIe	---	---	5.0
PfB2---------- Pacolet	IIIe	60	25	6.0
PfD2---------- Pacolet	VIe	50	20	5.0
PfE2---------- Pacolet	VIIe	---	---	4.5
PgE**. Pacolet-Urban land				

See footnotes at end of table.

Table 5.—Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Wheat	Pasture
		Bu	Bu	AUM*
Pt**. Pits, quarry				
RbB---------- Red Bay	IIe	80	35	9.0
RbC---------- Red Bay	IVe	60	30	8.5
ReF---------- Rion	VIIe	---	---	---
Rk---------- Roanoke	Vw	---	---	---
Sh---------- Shellbluff	IIw	120	45	9.5
ToA---------- Toccoa	IIIw	75	30	7.0
WeB---------- Wedowee	IIe	75	40	7.0
WeD---------- Wedowee	IVe	50	35	6.5
WeE---------- Wedowee	VIe	---	---	5.5
WgE---------- Wedowee	VIIe	---	---	---
WhB---------- Wickham	IIe	85	---	9.0
WkD:				
Wilkes----------	VIe	---	---	---
Zion----------	IIIe	---	---	---
WzF:				
Wynott----------	VIIe	---	---	---
Zion----------	VIe	---	---	---
Wilkes----------	VIIe	---	---	---

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 6.—Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland)

Map symbol	Soil name
AkA	Altavista sandy loam, 0 to 3 percent slopes, rarely flooded
AmB	Appling sandy loam, 2 to 6 percent slopes
CeB	Cecil sandy loam, 2 to 6 percent slopes
LdB	Lloyd loam, 2 to 6 percent slopes
MeB	Mecklenburg loam, 2 to 6 percent slopes
PaB	Pacolet sandy loam, 2 to 6 percent slopes
RbB	Red Bay sandy loam, 2 to 5 percent slopes
Sh	Shellbluff loam, 0 to 2 percent slopes, occasionally flooded
WeB	Wedowee sandy loam, 2 to 6 percent slopes
WhB	Wickham sandy loam, 0 to 4 percent slopes, rarely flooded

Table 7.—Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity class*	
AkA---------- Altavista	9A	Slight	Slight	Slight	Loblolly pine--------	91	9	Loblolly pine.
					White oak----------	77	4	
					Shortleaf pine-------	---	---	
					Sweetgum----------	---	---	
					Red maple----------	---	---	
					Yellow-poplar--------	---	---	
					Southern red oak-----	---	---	
					Water oak----------	---	---	
					American beech-------	---	---	
					Hickory----------	---	---	
AmB---------- Appling	8A	Slight	Slight	Slight	Loblolly pine--------	84	8	Loblolly pine, shortleaf pine.
					Shortleaf pine-------	65	7	
					Virginia pine--------	74	8	
					Scarlet oak----------	74	4	
					White oak----------	64	3	
					Yellow-poplar--------	88	6	
					Sweetgum----------	---	---	
					Southern red oak-----	---	---	
					Hickory----------	---	---	
ApD**:								
Ashlar----------	8S	Slight	Slight	Slight	Loblolly pine--------	75	8	Loblolly pine, shortleaf pine.
					Shortleaf pine-------	70	7	
					Virginia pine--------	70	7	
					Northern red oak-----	60	3	
Pacolet----------	8A	Slight	Slight	Slight	Loblolly pine--------	78	8	Loblolly pine, shortleaf pine, yellow-poplar.
					Shortleaf pine-------	70	8	
					Yellow-poplar--------	90	6	
					Virginia pine--------	---	---	
					Northern red oak-----	---	---	
					Hickory----------	---	---	
					White oak----------	---	---	
ApE**:								
Ashlar----------	7R	Moderate	Moderate	Moderate	Loblolly pine--------	75	7	Loblolly pine, shortleaf pine.
					Shortleaf pine-------	65	6	
Pacolet----------	8R	Moderate	Moderate	Slight	Loblolly pine--------	78	8	Loblolly pine, shortleaf pine, yellow-poplar.
					Shortleaf pine-------	70	8	
					Yellow-poplar--------	90	6	
					Virginia pine--------	---	---	
					Northern red oak-----	---	---	
					Hickory----------	---	---	
					White oak----------	---	---	
BwB---------- Buncombe	9S	Slight	Moderate	Moderate	Loblolly pine--------	90	9	Loblolly pine, yellow-poplar, American sycamore.
					American sycamore----	---	---	
					Sweetgum----------	---	---	
					Yellow-poplar--------	100	8	
					Northern red oak-----	---	---	
					Southern red oak-----	---	---	
					Hickory----------	---	---	
					Elm----------	---	---	
					River birch----------	---	---	

See footnotes at end of table.

Table 7.—Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
CeB, CeC---------- Cecil	8A	Slight	Slight	Slight	Loblolly pine--------	83	8	Loblolly pine, shortleaf pine.
					Shortleaf pine-------	69	8	
					Virginia pine--------	71	8	
					White oak----------	79	4	
					Northern red oak-----	81	4	
					Southern red oak-----	79	4	
					Post oak-----------	72	4	
					Scarlet oak----------	81	4	
					Sweetgum-----------	76	5	
					Yellow-poplar--------	92	6	
CfB2, CfC2--------- Cecil	7C	Slight	Moderate	Moderate	Loblolly pine--------	72	7	Loblolly pine, shortleaf pine.
					Shortleaf pine-------	63	7	
					Virginia pine--------	65	7	
					White oak----------	64	3	
					Northern red oak-----	---	---	
ChA---------- Chewacla	10W	Slight	Moderate	Slight	Yellow-poplar--------	95	7	Yellow-poplar, loblolly pine, sweetgum, American sycamore.
					Loblolly pine--------	95	10	
					Sweetgum-----------	97	9	
					Water oak----------	80	5	
					Eastern cottonwood---	---	---	
					Green ash----------	---	---	
					Southern red oak-----	---	---	
					Blackgum-----------	---	---	
					Red maple----------	---	---	
					Willow oak---------	---	---	
					American beech-------	---	---	
					American sycamore----	---	---	
Cr**: Chewacla----------	6W	Slight	Severe	Severe	Sweetgum-----------	85	6	Blackgum, water tupelo.
					Blackgum-----------	---	---	
					Water tupelo---------	---	---	
Roanoke----------	8W	Slight	Severe	Severe	Sweetgum-----------	94	8	Water tupelo.
					Baldcypress----------	---	---	
					Blackgum-----------	---	---	
					Water tupelo---------	---	---	
GeD---------- Gwinnett	8A	Slight	Slight	Slight	Loblolly pine--------	81	8	Loblolly pine, Virginia pine, yellow-poplar.
					Southern red oak-----	72	4	
					White oak----------	69	4	
GeE---------- Gwinnett	8R	Moderate	Moderate	Slight	Loblolly pine--------	81	8	Loblolly pine, Virginia pine, yellow-poplar.
					Southern red oak-----	72	4	
					White oak----------	69	4	
GwD2---------- Gwinnett	7C	Moderate	Moderate	Moderate	Loblolly pine--------	75	7	Eastern redcedar, loblolly pine, Virginia pine.
					Virginia pine--------	65	7	
					Shortleaf pine-------	65	7	
GwE2---------- Gwinnett	4R	Severe	Severe	Moderate	Loblolly pine--------	65	7	Loblolly pine, Virginia pine, eastern redcedar.
					Virginia pine--------	65	7	

See footnotes at end of table.

Table 7.—Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
IrB, IrC---------- Iredell	6C	Slight	Moderate	Moderate	Loblolly pine--------	67	6	Loblolly pine, white oak.
					Shortleaf pine-------	58	6	
					Post oak------------	44	2	
					White oak-----------	47	2	
LdB, LdC---------- Lloyd	8A	Slight	Slight	Slight	Loblolly pine--------	85	8	Loblolly pine, shortleaf pine.
					Northern red oak-----	80	4	
					Shortleaf pine-------	75	8	
					Southern red oak-----	80	4	
					White oak-----------	80	4	
					Yellow-poplar--------	85	6	
LfB2, LfD2--------- Lloyd	7C	Slight	Moderate	Moderate	Loblolly pine--------	71	7	Loblolly pine, shortleaf pine.
					Shortleaf pine-------	68	7	
					Northern red oak-----	75	4	
					White oak-----------	70	4	
					Southern red oak-----	75	4	
LfE2---------- Lloyd	7R	Moderate	Moderate	Moderate	Loblolly pine--------	71	7	Loblolly pine, shortleaf pine.
					Shortleaf pine-------	68	7	
					Northern red oak-----	75	4	
					White oak-----------	70	4	
					Southern red oak-----	75	4	
MaD---------- Madison	7A	Slight	Slight	Slight	Shortleaf pine-------	64	7	Loblolly pine, shortleaf pine.
					Loblolly pine--------	80	8	
					Southern red oak-----	75	4	
					Yellow-poplar--------	96	7	
					Virginia pine--------	71	8	
					Northern red oak-----	75	4	
					White oak-----------	75	4	
MaE---------- Madison	7R	Moderate	Moderate	Slight	Shortleaf pine-------	64	7	Loblolly pine, shortleaf pine.
					Loblolly pine--------	80	8	
					Southern red oak-----	75	4	
					Yellow-poplar--------	96	7	
					Virginia pine--------	71	8	
					Northern red oak-----	75	4	
					White oak-----------	75	4	
MdD2---------- Madison	6C	Slight	Moderate	Moderate	Shortleaf pine-------	62	6	Loblolly pine, shortleaf pine.
					Loblolly pine--------	72	7	
					Virginia pine--------	66	7	
					Northern red oak-----	66	3	
					White oak-----------	---	---	
MdE2---------- Madison	6R	Moderate	Moderate	Moderate	Shortleaf pine-------	62	6	Loblolly pine, shortleaf pine.
					Loblolly pine--------	72	7	
					Virginia pine--------	66	7	
					Northern red oak-----	66	3	
					White oak-----------	---	---	

See footnotes at end of table.

Table 7.—Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
MeB, MeC---------- Mecklenburg	7A	Slight	Slight	Slight	Shortleaf pine-------	64	7	Loblolly pine, shortleaf pine.
					Loblolly pine--------	79	8	
					Virginia pine--------	62	7	
					Yellow-poplar--------	97	7	
					Northern red oak-----	---	---	
					Sweetgum-------------	---	---	
					White oak------------	---	---	
					Hickory--------------	---	---	
MoC---------- Molena	8S	Slight	Moderate	Moderate	Loblolly pine--------	80	8	Loblolly pine.
					Northern red oak-----	86	5	
					White oak------------	68	4	
					Shortleaf pine-------	---	---	
					Water oak------------	---	---	
PaB, PaD---------- Pacolet	8A	Slight	Slight	Slight	Loblolly pine--------	78	8	Loblolly pine, shortleaf pine, yellow-poplar.
					Shortleaf pine-------	70	8	
					Yellow-poplar--------	90	6	
					Virginia pine--------	---	---	
					Northern red oak-----	---	---	
					Hickory--------------	---	---	
					White oak------------	---	---	
PaE---------- Pacolet	8R	Moderate	Moderate	Slight	Loblolly pine--------	78	8	Loblolly pine, shortleaf pine, yellow-poplar.
					Shortleaf pine-------	70	8	
					Yellow-poplar--------	90	6	
					Virginia pine--------	---	---	
					Northern red oak-----	---	---	
					Hickory--------------	---	---	
					White oak------------	---	---	
PfB2, PfD2--------- Pacolet	6C	Slight	Moderate	Moderate	Loblolly pine--------	70	6	Loblolly pine, shortleaf pine, yellow-poplar.
					Shortleaf pine-------	60	6	
					Yellow-poplar--------	80	5	
PfE2---------- Pacolet	6R	Moderate	Moderate	Moderate	Loblolly pine--------	70	6	Loblolly pine, shortleaf pine, yellow-poplar.
					Shortleaf pine-------	60	6	
					Yellow-poplar--------	80	5	
RbB, RbC---------- Red Bay	9A	Slight	Slight	Slight	Loblolly pine--------	90	9	Loblolly pine.
ReF---------- Rion	8R	Moderate	Moderate	Slight	Loblolly pine--------	80	8	Loblolly pine, shortleaf pine, yellow-poplar.
					Post oak-------------	65	3	
					Shortleaf pine-------	70	8	
					Southern red oak-----	80	4	
					Sweetgum-------------	80	6	
					White oak------------	70	4	
					Yellow-poplar--------	90	6	
					Hickory--------------	---	---	
					Northern red oak-----	---	---	
Rk---------- Roanoke	7W	Slight	Severe	Severe	Sweetgum-------------	90	7	Willow oak, green ash.
					Willow oak-----------	76	4	
					White oak------------	75	4	

See footnotes at end of table.

Table 7.—Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
Sh	10A	Slight	Slight	Slight	Sweetgum	100	10	Loblolly pine, yellow-poplar.
Shellbluff					Yellow-poplar	105	8	
					Cherrybark oak	105	12	
					Eastern cottonwood	105	10	
					Scarlet oak	100	6	
					Black walnut	100	---	
ToA	9A	Slight	Slight	Slight	Loblolly pine	90	9	Loblolly pine, yellow-poplar, American sycamore, cherrybark oak.
Toccoa					Yellow-poplar	107	8	
					Sweetgum	100	10	
					Southern red oak	---	---	
WeB, WeD	8A	Slight	Slight	Slight	Loblolly pine	80	8	Loblolly pine, Virginia pine, shortleaf pine, yellow-poplar.
Wedowee					Virginia pine	70	8	
					Shortleaf pine	70	8	
					Southern red oak	70	4	
					Northern red oak	70	4	
					White oak	65	3	
WeE, WgE	8R	Moderate	Moderate	Slight	Loblolly pine	80	8	Loblolly pine, Virginia pine, shortleaf pine, yellow-poplar.
Wedowee					Virginia pine	70	8	
					Shortleaf pine	70	8	
					Southern red oak	70	4	
					Northern red oak	70	4	
					White oak	65	3	
WhB	9A	Slight	Slight	Slight	Loblolly pine	90	9	Loblolly pine, yellow-poplar.
Wickham					Yellow-poplar	89	6	
					White oak	84	5	
					Southern red oak	82	4	
					Sweetgum	---	---	
					Red maple	---	---	
					Northern red oak	---	---	
					Water oak	---	---	
					Hickory	---	---	
					Shortleaf pine	---	---	
WkD**:								
Wilkes	6D	Slight	Slight	Slight	Loblolly pine	65	6	Loblolly pine, Virginia pine.
					Shortleaf pine	50	5	
					Southern red oak	76	4	
					Sweetgum	---	---	
					White oak	---	---	
					Hickory	---	---	
					Virginia pine	---	---	
Zion	6D	Slight	Slight	Slight	Loblolly pine	70	6	Loblolly pine.
					Northern red oak	70	4	
					Shortleaf pine	60	6	
					Virginia pine	60	6	
WzF**:								
Wynott	7R	Moderate	Moderate	Slight	Loblolly pine	75	7	Loblolly pine.
					Sweetgum	---	---	
					Southern red oak	---	---	
					White oak	---	---	
					Willow oak	---	---	
					Hickory	---	---	
					Yellow-poplar	---	---	

See footnotes at end of table.

Table 7.—Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity class*	
WzF**:								
Zion	6R	Slight	Slight	Slight	Loblolly pine	70	6	Loblolly pine.
					Northern red oak	70	4	
					Shortleaf pine	60	6	
					Virginia pine	60	6	
Wilkes	6R	Moderate	Moderate	Slight	Loblolly pine	65	6	Loblolly pine, Virginia pine.
					Shortleaf pine	50	5	
					Southern red oak	76	4	
					Sweetgum	---	---	
					White oak	---	---	
					Hickory	---	---	
					Virginia pine	---	---	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 8.—Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
AkA Altavista	Severe: flooding.	Moderate: flooding.	Moderate: wetness.	Moderate: wetness.
AmB Appling	Slight	Slight	Moderate: slope.	Slight.
ApD*: Ashlar	Slight	Slight	Severe: slope.	Slight.
Pacolet	Slight	Slight	Severe: slope.	Slight.
ApE*: Ashlar	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
BwB Buncombe	Severe: flooding.	Moderate: too sandy.	Moderate: too sandy, flooding.	Moderate: too sandy.
CeB Cecil	Slight	Slight	Moderate: slope.	Slight.
CeC Cecil	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
CfB2 Cecil	Slight	Slight	Moderate: slope.	Slight.
CfC2 Cecil	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
ChA Chewacla	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
Cr*: Chewacla	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.
Roanoke	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding, erodes easily.
GeD Gwinnett	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
GeE Gwinnett	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.

See footnote at end of table.

Table 8.—Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
GwD2 Gwinnett	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
GwE2 Gwinnett	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
IrB Iredell	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
IrC Iredell	Severe: wetness.	Moderate: slope, wetness.	Severe: slope, wetness.	Moderate: wetness.
LdB Lloyd	Slight	Slight	Moderate: slope.	Slight.
LdC Lloyd	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
LfB2 Lloyd	Slight	Slight	Moderate: slope.	Slight.
LfD2 Lloyd	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
LfE2 Lloyd	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
LuC*: Lloyd	Slight	Slight	Severe: slope.	Slight.
Urban land.				
MaD Madison	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
MaE Madison	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
MdD2 Madison	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
MdE2 Madison	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
MeB Mecklenburg	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Slight.
MeC Mecklenburg	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
MoC Molena	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.
PaB Pacolet	Slight	Slight	Moderate: slope, small stones.	Slight.

See footnote at end of table.

Table 8.—Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
PaD---------- Pacolet	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
PaE---------- Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
PfB2---------- Pacolet	Slight----------	Slight----------	Moderate: slope.	Slight.
PfD2---------- Pacolet	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
PfE2---------- Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
PgE*: Pacolet----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Urban land.				
Pt*. Pits, quarry				
RbB---------- Red Bay	Slight----------	Slight----------	Moderate: slope.	Slight.
RbC---------- Red Bay	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
ReF---------- Rion	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rk---------- Roanoke	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
Sh---------- Shellbluff	Severe: flooding.	Slight----------	Moderate: flooding.	Slight.
ToA---------- Toccoa	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
WeB---------- Wedowee	Slight----------	Slight----------	Moderate: slope.	Slight.
WeD---------- Wedowee	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
WeE---------- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
WgE---------- Wedowee	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
WhB---------- Wickham	Severe: flooding.	Slight----------	Moderate: slope.	Slight.

See footnote at end of table.

Table 8.—Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
WkD*:				
Wilkes	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
Zion	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight.
WzF*:				
Wynott	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Zion	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Wilkes	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 9.—Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AkA---- Altavista	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
AmB---- Appling	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ApD*:										
Ashlar----	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
Pacolet----	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
ApE*:										
Ashlar----	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Pacolet----	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
BwB---- Buncombe	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
CeB---- Cecil	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CeC---- Cecil	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CfB2---- Cecil	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CfC2---- Cecil	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
ChA---- Chewacla	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Cr*:										
Chewacla----	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Roanoke----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
GeD---- Gwinnett	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GeE---- Gwinnett	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
GwD2---- Gwinnett	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 9.—Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
GwE2---- Gwinnett	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
IrB, IrC---- Iredell	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LdB---- Lloyd	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LdC---- Lloyd	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LfB2---- Lloyd	Fair	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
LfD2---- Lloyd	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
LfE2---- Lloyd	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
LuC*: Lloyd----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
MaD---- Madison	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MaE---- Madison	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MdD2---- Madison	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
MdE2---- Madison	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MeB---- Mecklenburg	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MeC---- Mecklenburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MoC---- Molena	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
PaB---- Pacolet	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
PaD---- Pacolet	Poor	Fair	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
PaE---- Pacolet	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
PfB2---- Pacolet	Poor	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

Table 9.—Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
PfD2--- Pacolet	Very poor.	Poor	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
PfE2--- Pacolet	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
PgE*: Pacolet---	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Urban land.										
Pt*. Pits, quarry										
RbB--- Red Bay	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RbC--- Red Bay	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ReF--- Rion	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Rk--- Roanoke	Poor	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Sh--- Shellbluff	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
ToA--- Toccoa	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
WeB--- Wedowee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WeD--- Wedowee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WeE, WgE--- Wedowee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
WhB--- Wickham	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WkD*: Wilkes---	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Zion---	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WzF*: Wynott---	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Zion---	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

Table 9.—Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
WzF*:										
Wilkes	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 10.—Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AkA Altavista	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: low strength, wetness, flooding.	Severe: wetness.
AmB Appling	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
ApD*: Ashlar	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Moderate: droughty, depth to rock.
Pacolet	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
ApE*: Ashlar	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BwB Buncombe	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: droughty.
CeB Cecil	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
CeC Cecil	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
CfB2 Cecil	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
CfC2 Cecil	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
ChA Chewacla	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Cr*: Chewacla	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.

See footnote at end of table.

Table 10.—Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Cr*:						
Roanoke	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
GeD--- Gwinnett	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
GeE--- Gwinnett	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
GwD2--- Gwinnett	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
GwE2--- Gwinnett	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
IrB--- Iredell	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
IrC--- Iredell	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: wetness, slope.
LdB--- Lloyd	Moderate: too clayey.	Slight---	Slight---	Moderate: slope.	Moderate: low strength.	Slight.
LdC--- Lloyd	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
LfB2--- Lloyd	Moderate: too clayey.	Slight---	Slight---	Moderate: slope.	Moderate: low strength.	Slight.
LfD2--- Lloyd	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
LfE2--- Lloyd	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
LuC*:						
Lloyd	Moderate: too clayey.	Slight---	Slight---	Moderate: slope.	Moderate: low strength.	Slight.
Urban land.						
MaD--- Madison	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
MaE--- Madison	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

Table 10.—Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MdD2---------- Madison	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
MdE2---------- Madison	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MeB---------- Mecklenburg	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
MeC---------- Mecklenburg	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
MoC---------- Molena	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
PaB---------- Pacolet	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Slight.
PaD---------- Pacolet	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
PaE---------- Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PfB2---------- Pacolet	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Slight.
PfD2---------- Pacolet	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
PfE2---------- Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PgE*: Pacolet----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Urban land.						
Pt*. Pits, quarry						
RbB---------- Red Bay	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
RbC---------- Red Bay	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
ReF---------- Rion	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rk---------- Roanoke	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.

See footnote at end of table.

Table 10.—Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Sh---------- Shellbluff	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
ToA---------- Toccoa	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
WeB---------- Wedowee	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Slight.
WeD---------- Wedowee	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
WeE, WgE---------- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
WhB---------- Wickham	Slight---------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
WkD*:						
Wilkes----------	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Severe: depth to rock.
Zion----------	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: droughty, slope, depth to rock.
WzF*:						
Wynott----------	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Zion----------	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Wilkes----------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope, depth to rock.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 11.—Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AkA Altavista	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
AmB Appling	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
ApD*: Ashlar	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
Pacolet	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: too clayey.
ApE*: Ashlar	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
BwB Buncombe	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
CeB Cecil	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
CeC Cecil	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
CfB2 Cecil	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
CfC2 Cecil	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
ChA Chewacla	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.

See footnote at end of table.

Table 11.–Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Cr*:					
Chewacla	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: hard to pack, ponding.
Roanoke	Severe: flooding, ponding, percs slowly.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
GeD Gwinnett	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: depth to rock, too clayey, slope.
GeE Gwinnett	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
GwD2 Gwinnett	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: depth to rock, too clayey, slope.
GwE2 Gwinnett	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
IrB Iredell	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
IrC Iredell	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
LdB Lloyd	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
LdC Lloyd	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
LfB2 Lloyd	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
LfD2 Lloyd	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
LfE2 Lloyd	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

Table 11.—Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LuC*:					
Lloyd	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
Urban land.					
MaD:					
Madison	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: too clayey.
MaE:					
Madison	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
MdD2:					
Madison	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: too clayey.
MdE2:					
Madison	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
MeB:					
Mecklenburg	Severe: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
MeC:					
Mecklenburg	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
MoC:					
Molena	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too sandy.
PaB:					
Pacolet	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: too clayey.
PaD:					
Pacolet	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: too clayey, slope.
PaE:					
Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
PfB2:					
Pacolet	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: too clayey.
PfD2:					
Pacolet	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: too clayey, slope.
PfE2:					
Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
PgE*:					
Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

Table 11.—Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PgE*: Urban land.					
Pt*. Pits, quarry					
RbB---- Red Bay	Slight----	Moderate: seepage, slope.	Slight----	Slight----	Good.
RbC---- Red Bay	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
ReF---- Rion	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Rk---- Roanoke	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Sh---- Shellbluff	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
ToA---- Toccoa	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Good.
WeB---- Wedowee	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----	Slight----	Fair: small stones.
WeD---- Wedowee	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
WeE, WgE---- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
WhB---- Wickham	Moderate: flooding, percs slowly.	Moderate: seepage, slope.	Moderate: flooding, too clayey.	Moderate: flooding.	Fair: too clayey.
WkD*: Wilkes----	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Zion----	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.

See footnote at end of table.

Table 11.—Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
WzF*:					
Wynott	Severe: depth to rock, percs slowly, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Zion	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Wilkes	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 12.—Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AkA Altavista	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
AmB Appling	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
ApD*: Ashlar	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Pacolet	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
ApE*: Ashlar	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Pacolet	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
BwB Buncombe	Good	Probable	Improbable: too sandy.	Poor: too sandy.
CeB, CeC, CfB2, CfC2 Cecil	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
ChA Chewacla	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Cr*: Chewacla	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Roanoke	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
GeD Gwinnett	Fair: low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
GeE Gwinnett	Moderate: slope, low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
GwD2 Gwinnett	Fair: low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

See footnote at end of table.

Table 12.—Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
GwE2---------- Gwinnett	Moderate: slope, low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
IrB, IrC---------- Iredell	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
LdB, LdC, LfB2, LfD2-- Lloyd	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
LfE2---------- Lloyd	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
LuC*: Lloyd----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Urban land.				
MaD---------- Madison	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MaE---------- Madison	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
MdD2---------- Madison	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MdE2---------- Madison	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
MeB, MeC---------- Mecklenburg	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MoC---------- Molena	Good----------	Probable----------	Improbable: too sandy.	Fair: too sandy.
PaB, PaD---------- Pacolet	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
PaE---------- Pacolet	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
PfB2, PfD2---------- Pacolet	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
PfE2---------- Pacolet	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
PgE*: Pacolet----------	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.

See footnote at end of table.

Table 12.—Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
PgE*: Urban land.				
Pt*. Pits, quarry				
RbB, RbC---------- Red Bay	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
ReF---------- Rion	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Rk---------- Roanoke	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Sh---------- Shellbluff	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
ToA---------- Toccoa	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
WeB, WeD---------- Wedowee	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
WeE, WgE---------- Wedowee	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
WhB---------- Wickham	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
WkD*: Wilkes----------	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Zion----------	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
WzF*: Wynott----------	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
Zion----------	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Wilkes----------	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 13.—Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AkA Altavista	Moderate: seepage.	Severe: piping, wetness.	---	Wetness	Wetness	Favorable.
AmB Appling	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope	---	Favorable.
ApD*:						
Ashlar	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty.	Depth to rock	Droughty, depth to rock.
Pacolet	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	---	Favorable.
ApE*:						
Ashlar	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty.	Slope, depth to rock.	Slope, droughty, depth to rock.
Pacolet	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
BwB Buncombe	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, slope.	Too sandy	Droughty, rooting depth.
CeB Cecil	Moderate: seepage, slope.	Severe: piping, hard to pack.	Deep to water	Slope	---	Favorable.
CeC Cecil	Severe: slope.	Severe: piping, hard to pack.	Deep to water	Slope	Slope	Slope.
CfB2 Cecil	Moderate: seepage, slope.	Severe: piping, hard to pack.	Deep to water	Slope	Favorable	Favorable.
CfC2 Cecil	Severe: slope.	Severe: piping, hard to pack.	Deep to water	Slope	Slope	Slope.
ChA Chewacla	Moderate: seepage.	Severe: piping, hard to pack, wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.
Cr*:						
Chewacla	Moderate: seepage.	Severe: piping, hard to pack, ponding.	Ponding, flooding.	Ponding, flooding.	Ponding	Wetness.

See footnote at end of table.

Table 13.—Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Cr*:						
Roanoke	Moderate: seepage.	Severe: ponding.	Ponding, percs slowly, flooding.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
GeD, GeE Gwinnett	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
GwD2, GwE2 Gwinnett	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
IrB Iredell	Moderate: slope.	Severe: hard to pack.	Percs slowly, slope.	Slope, wetness.	Wetness	Wetness, percs slowly.
IrC Iredell	Severe: slope.	Severe: hard to pack.	Percs slowly, slope.	Slope, wetness.	Slope, wetness.	Wetness, slope, percs slowly.
LdB Lloyd	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope	Favorable	Favorable.
LdC Lloyd	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
LfB2 Lloyd	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope	Favorable	Favorable.
LfD2, LfE2 Lloyd	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
LuC*:						
Lloyd	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope	---	Favorable.
Urban land.						
MaD, MaE, MdD2, MdE2 Madison	Severe: slope.	Severe: piping, hard to pack.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
MeB Mecklenburg	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly.	Percs slowly	Percs slowly.
MeC Mecklenburg	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
MoC Molena	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy	Droughty.
PaB Pacolet	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	---	Favorable.

See footnote at end of table.

Table 13.—Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
PaD, PaE---------- Pacolet	Severe: slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
PfB2---------- Pacolet	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
PfD2, PfE2-------- Pacolet	Severe: slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
PgE*: Pacolet----------	Severe: slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
Urban land.						
Pt*. Pits, quarry						
RbB---------- Red Bay	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
RbC---------- Red Bay	Severe: slope.	Slight---------	Deep to water	Slope----------	Slope----------	Slope.
ReF---------- Rion	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope----------	Slope, droughty.
Rk---------- Roanoke	Severe: seepage.	Severe: wetness.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Sh---------- Shellbluff	Moderate: seepage.	Severe: piping.	Deep to water	Flooding-------	Favorable------	Favorable.
ToA---------- Toccoa	Severe: seepage.	Severe: piping.	Flooding-------	Flooding-------	Favorable------	Favorable.
WeB---------- Wedowee	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
WeD, WeE, WgE----- Wedowee	Severe: slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
WhB---------- Wickham	Moderate: seepage.	Severe: piping.	Deep to water	Favorable------	---	Favorable.
WkD*: Wilkes----------	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Zion----------	Severe: slope.	Severe: thin layer.	Deep to water	Slope, droughty.	Slope, depth to rock.	Slope, droughty.

See footnote at end of table.

Table 13.—Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
WzF*:						
Wynott	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly.	Slope, depth to rock.	Slope, depth to rock, percs slowly.
Zion	Severe: slope.	Severe: thin layer.	Deep to water	Slope, droughty.	Slope, depth to rock.	Slope, droughty.
Wilkes	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 14.—Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
AkA---------- Altavista	0-10	Sandy loam-------	ML, CL-ML, SM, SC-SM	A-4	0	95-100	90-100	65-99	35-60	20-30	NP-7
	10-36	Clay loam, sandy clay loam, loam.	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7	0	95-100	95-100	60-99	45-75	25-45	5-28
	36-60	Variable---------	---	---	---	---	---	---	---	---	---
AmB---------- Appling	0-6	Sandy loam-------	SM, SC-SM	A-2	0-5	86-100	80-100	55-91	15-35	15-35	NP-7
	6-41	Sandy clay, clay loam, clay, sandy clay loam.	MH, ML, CL	A-7	0-5	95-100	90-100	70-95	51-80	41-74	15-30
	41-51	Sandy clay, clay loam, sandy clay loam.	SC, CL	A-4, A-6, A-7	0-5	95-100	85-100	70-90	40-75	30-50	8-22
	51-60	Variable---------	---	---	---	---	---	---	---	---	---
ApD*, ApE*:											
Ashlar----------	0-15	Sandy loam, coarse sandy loam.	SM, SC-SM	A-2, A-4, A-1	0-2	80-100	85-100	40-80	20-50	<25	NP-6
	15-25	Sandy loam, fine sandy loam, gravelly sandy loam, loamy coarse sand.	GM-GC, SC-SM, GM, SM	A-2, A-2, A-4	0-8	55-100	50-100	30-75	15-50	15-25	NP-6
Pacolet---------	0-7	Sandy loam-------	SM, SC-SM	A-2, A-1-b, A-4	0-2	85-100	80-100	42-90	16-42	<28	NP-7
	7-25	Sandy clay, clay loam, clay.	ML, MH, CL	A-6, A-7	0-1	80-100	80-100	60-100	51-75	38-65	11-33
	25-54	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SC-SM, SC	A-2, A-4, A-6	0-2	80-100	85-100	60-80	30-60	20-35	5-15
	54-60	Sandy loam, fine sandy loam, loam.	SM, SC-SM	A-4, A-2-4	0-2	80-100	85-100	60-90	25-50	<28	NP-6
BwB---------- Buncombe	0-10	Loamy sand-------	SM, SP-SM	A-2, A-3	0	98-100	98-100	90-97	7-32	10-20	NP
	10-60	Loamy sand, loamy fine sand, sand.	SM, SP-SM	A-2, A-3	0	98-100	98-100	98-100	7-32	10-20	NP
CeB, CeC--------- Cecil	0-8	Sandy loam-------	SM, SC-SM	A-2, A-4	0-5	84-100	85-100	67-90	26-42	15-30	NP-7
	8-11	Sandy clay loam, clay loam.	SM, SC, ML, CL	A-4, A-6	0-5	75-100	85-100	68-95	38-81	21-40	3-17
	11-48	Clay, clay loam, sandy clay.	MH, ML, CH	A-7, A-5	0-5	97-100	92-100	72-100	55-95	41-80	9-37
	48-60	Variable---------	---	---	---	---	---	---	---	---	---
CfB2, CfC2------- Cecil	0-4	Sandy clay loam	SM, SC, CL, ML	A-4, A-6	0-5	75-100	85-100	68-95	38-81	21-40	3-17
	4-50	Clay, clay loam sandy clay.	MH, ML, CH	A-7, A-5	0-5	97-100	92-100	72-100	55-95	41-80	9-37
	50-60	Variable---------	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
ChA---------- Chewacla	0-6	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0	98-100	95-100	70-100	55-90	25-49	4-20
	6-32	Silt loam, silty clay loam, clay loam.	ML, CL	A-4, A-6, A-7	0	96-100	95-100	80-100	51-98	30-49	4-22
	32-38	Sandy clay loam, loam, sandy loam.	SM, SC-SM, ML, CL	A-4, A-7-6, A-6	0	96-100	95-100	60-100	36-70	20-45	2-15
	38-65	Variable---------	---	---	---	---	---	---	---	---	---
Cr*:											
Chewacla--------	0-6	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0	98-100	95-100	70-100	55-90	25-49	4-20
	6-32	Silt loam, silty clay loam, clay loam.	ML, CL	A-4, A-6, A-7	0	96-100	95-100	80-100	51-98	30-49	4-22
	32-38	Sandy clay loam, loam, sandy loam.	SM, SC-SM, ML, CL	A-4, A-7-6, A-6	0	96-100	95-100	60-100	36-70	20-45	2-15
	38-65	Variable---------	---	---	---	---	---	---	---	---	---
Roanoke---------	0-7	Silt loam--------	SC-SM, CL-ML, CL, SC	A-6, A-4	0	95-100	85-100	60-100	35-90	20-35	5-16
	7-50	Clay, silty clay, clay loam.	CH, CL	A-7	0	90-100	85-100	85-100	65-95	45-70	22-40
	50-72	Stratified sandy clay to clay.	CL, SM, CH, ML	A-2-4, A-4, A-6, A-7	0-5	40-100	85-100	25-95	15-90	10-60	NP-40
GeD, GeE--------- Gwinnett	0-5	Sandy loam-------	SM, SC, SC-SM, ML	A-2, A-4, A-6	0-3	95-100	85-100	65-90	30-60	<32	NP-12
	5-39	Clay, sandy clay, clay loam.	MH, ML, CL, CH	A-7, A-6	0-4	95-100	90-100	75-95	51-80	38-65	16-30
	39-53	Sandy clay loam, clay loam, loam.	ML, CL, SC	A-4, A-6	0-6	90-100	85-100	80-90	35-80	25-40	7-22
	53-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
GwD2, GwE2------- Gwinnett	0-5	Sandy clay loam	SC, ML, SC-SM, CL-ML	A-4, A-6	0-3	95-100	85-100	70-90	40-80	20-35	4-12
	5-37	Clay, sandy clay, clay loam.	MH, ML, CL, CH	A-7, A-6	0-4	95-100	90-100	75-95	51-80	38-65	16-30
	37-52	Sandy clay loam, clay loam, loam.	ML, CL, SC	A-4, A-6	0-6	90-100	85-100	80-90	35-80	25-40	7-22
	52-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
IrB, IrC--------- Iredell	0-5	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-4	0-1	90-98	80-96	60-82	30-50	<35	NP-9
	5-24	Clay-------------	CH	A-7	0	99-100	85-100	60-100	55-95	54-115	29-85
	24-60	Variable---------	---	---	---	---	---	---	---	---	---
LdB, LdC--------- Lloyd	0-9	Loam-------------	CL, ML, CL-ML	A-7-6, A-6, A-4	0-2	95-100	95-100	88-100	50-85	25-49	3-23
	9-56	Clay, silty clay, clay loam.	ML, MH	A-7-5, A-7-6	0-2	95-100	95-100	80-100	51-95	40-80	12-36
	56-60	Sandy loam, loam, sandy clay loam.	SM, ML, SC-SM, CL	A-4, A-6, A-7	0-5	90-100	85-99	60-90	36-70	20-49	4-20

See footnote at end of table.

Table 14.–Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
LfB2, LfD2, LfE2-Lloyd	0-6	Clay loam--------	CL, ML, CL-ML	A-7-6, A-6, A-4	0-2	95-100	95-100	88-100	50-85	25-49	3-23
	6-48	Clay, silty clay, clay loam.	ML, MH	A-7-5, A-7-6	0-2	95-100	95-100	80-100	51-95	40-80	12-36
	48-60	Sandy loam, loam, sandy clay loam.	SM, ML, SC-SM, CL	A-4, A-6, A-7	0-5	90-100	85-99	60-90	36-70	20-49	4-20
LuC*:											
Lloyd----------	0-9	Sandy loam-------	SM, SC-SM	A-4, A-2	0-2	95-100	90-100	70-95	30-50	20-35	NP-7
	9-56	Clay, silty clay, clay loam.	ML, MH	A-7-5, A-7-6	0-2	95-100	95-100	80-100	51-95	40-80	12-36
	56-60	Sandy loam, loam, sandy clay loam.	SM, ML, SC-SM, CL	A-4, A-6, A-7	0-5	90-100	85-99	60-90	36-70	20-49	4-20
Urban land.											
MaD, MaE--------- Madison	0-5	Sandy loam-------	SM, ML	A-2, A-4	0-3	85-100	80-100	60-90	26-55	25-35	NP-8
	5-24	Clay, clay loam, sandy clay.	MH, ML	A-7	0-3	90-100	85-100	75-100	57-85	43-75	12-35
	24-38	Loam, sandy clay loam, clay loam.	CL	A-4, A-6	0-3	90-100	85-100	70-95	50-80	30-40	7-20
	38-60	Fine sandy loam, sandy loam, loam, sandy clay loam.	SM, ML	A-2, A-4	0-5	85-100	80-100	60-90	26-55	25-35	NP-7
MdD2, MdE2------- Madison	0-4	Sandy clay loam	CL, ML, SC	A-4, A-6, A-7-6	0-3	90-100	85-100	70-95	46-80	30-50	7-20
	4-27	Clay, clay loam, sandy clay.	MH, ML	A-7	0-3	90-100	85-100	75-100	57-85	43-75	12-35
	27-60	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0-5	85-100	80-100	60-90	26-55	25-35	NP-7
MeB, MeC--------- Mecklenburg	0-8	Loam-------------	ML, SM, CL-ML, CL	A-4, A-6	0-5	90-100	85-100	65-90	36-65	20-40	NP-15
	8-26	Clay-------------	CH, MH	A-7	0-5	90-100	85-100	80-100	75-95	51-75	20-43
	26-33	Loam, sandy clay loam, clay loam.	CL	A-4, A-6, A-7	0-5	90-100	85-100	80-100	50-80	25-49	8-25
	33-60	Variable---------	---	---	---	---	---	---	---	---	---
MoC--------------- Molena	0-10	Loamy sand-------	SM, SP-SM	A-2, A-3	0	100	98-100	55-95	5-15	---	NP
	10-42	Loamy fine sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	98-100	55-95	7-25	---	NP
	42-60	Sand, coarse sand, gravelly sand.	SP, SP-SM	A-2, A-3	0-5	90-100	60-100	51-80	2-12	---	NP
PaB, PaD, PaE---- Pacolet	0-7	Sandy loam-------	SM, SC-SM	A-2, A-1-b, A-4	0-2	85-100	85-100	42-90	16-42	<28	NP-7
	7-25	Sandy clay, clay loam, clay.	ML, MH, CL	A-6, A-7	0-1	80-100	85-100	60-100	51-75	38-65	11-33
	25-54	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SC-SM, SC	A-2, A-4, A-6	0-2	80-100	70-100	60-80	30-60	20-35	5-15
	54-60	Sandy loam, fine sandy loam, loam.	SM, SC-SM	A-4, A-2-4	0-2	80-100	70-100	60-90	25-50	<28	NP-6

See footnote at end of table.

Table 14.—Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
PfB2, PfD2, PfE2- Pacolet	0-6	Sandy clay loam	SC-SM, SC	A-4, A-6	0-1	95-100	90-100	65-87	36-50	20-40	4-17
	6-18	Sandy clay, clay loam, clay.	ML, MH, CL	A-6, A-7	0-1	80-100	80-100	60-100	51-75	38-65	11-33
	18-24	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SC-SM, SC	A-2, A-4, A-6	0-2	80-100	85-100	60-80	30-60	20-35	5-15
	24-60	Sandy loam, fine sandy loam, loam.	SM, SC-SM	A-4, A-2-4	0-2	80-100	70-100	60-90	25-50	<28	NP-6
PgE*: Pacolet	0-7	Sandy loam	SM, SC-SM	A-2, A-1-b, A-4	0-2	85-100	85-100	42-90	16-42	<28	NP-7
	7-25	Sandy clay, clay loam, clay.	ML, MH, CL	A-6, A-7	0-1	80-100	80-100	60-100	51-75	38-65	11-33
	25-54	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SC-SM, SC	A-2, A-4, A-6	0-2	80-100	85-100	60-80	30-60	20-35	5-15
	54-60	Sandy loam, fine sandy loam, loam.	SM, SC-SM	A-4, A-2-4	0-2	80-100	70-100	60-90	25-50	<28	NP-6
Urban land.											
Pt*. Pits, quarry											
RbB, RbC Red Bay	0-8	Sandy loam	SM, SC-SM	A-2, A-4	0	100	95-100	60-85	15-45	<20	NP-4
	8-22	Sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4	0	100	95-100	60-85	15-50	<35	NP-10
	22-60	Sandy clay loam	SC-SM, SC	A-2, A-4, A-6	0	100	95-100	70-90	24-50	18-40	4-16
ReF Rion	0-7	Sandy loam	SM	A-2, A-4	0-2	90-100	85-100	60-80	20-45	<35	NP-7
	7-36	Sandy loam, sandy clay loam, clay loam.	SC, SC-SM, CL-ML, CL	A-2, A-4, A-6	0-2	90-100	85-100	60-85	30-60	20-35	5-15
	36-60	Sandy loam, sandy clay loam, loamy sand.	SC, SM, SC-SM	A-2, A-4, A-6	0-2	90-100	80-100	60-85	15-50	<36	NP-12
Rk Roanoke	0-8	Silt loam	SC-SM, CL-ML, CL, SC	A-4, A-6	0	95-100	85-100	60-100	35-90	20-35	5-16
	8-60	Clay, silty clay, clay loam.	CH, CL	A-7	0	90-100	85-100	85-100	65-95	45-70	22-40
Sh Shellbluff	0-6	Loam	ML, CL-ML, CL	A-4, A-6	0	98-100	95-100	90-100	75-95	15-40	NP-14
	6-60	Silty clay loam, silt loam, loam.	CL, CL-ML, ML	A-4, A-6, A-7-6	0	98-100	95-100	70-100	70-95	20-41	4-22
ToA Toccoa	0-4	Fine sandy loam	SM, ML	A-2, A-4	0	95-100	95-100	50-85	30-55	<30	NP-4
	4-60	Sandy loam, loam	SM, ML	A-2, A-4	0	95-100	90-100	60-100	30-55	<30	NP-4

See footnote at end of table.

Table 14.—Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
WeB, WeD, WeE---- Wedowee	0-5	Sandy loam-------	SM, SC-SM	A-4, A-2-4	0	95-100	85-100	50-99	23-50	<30	NP-6
	5-32	Sandy clay, clay loam, clay.	SC, ML, CL, MH	A-6, A-7	0	95-100	95-100	65-97	45-75	28-58	5-30
	32-60	Sandy clay loam, clay loam, sandy loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	80-100	70-100	60-80	30-60	20-54	5-25
WgE---------- Wedowee	0-5	Gravelly sandy loam.	SM, SC-SM	A-4, A-2, A-1	0-5	70-95	50-80	45-60	15-40	<25	NP-6
	5-35	Sandy clay, clay loam, clay.	SC, ML, CL, MH	A-6, A-7	0	95-100	95-100	65-97	45-75	28-58	5-30
	35-60	Sandy clay loam, clay loam, sandy loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	80-100	70-100	60-80	30-60	20-54	5-25
WhB---------- Wickham	0-7	Sandy loam-------	SM, SC-SM, ML, CL-ML	A-4	0	95-100	90-100	70-100	45-80	15-25	NP-7
	7-40	Sandy clay loam, clay loam, loam.	CL-ML, CL, SC, SM	A-2, A-4, A-6, A-7-6	0	95-100	90-100	75-100	30-70	20-41	3-15
	40-60	Variable---------	---	---	---	---	---	---	---	---	---
WkD*:											
Wilkes----------	0-6	Sandy loam-------	ML, SM	A-2, A-4	0-10	90-100	80-100	60-92	25-55	15-35	NP-7
	6-18	Clay loam, clay, sandy clay loam.	CL, CH	A-6, A-7	0-10	80-100	80-100	75-96	50-85	30-60	11-35
	18-45	Weathered bedrock	---	---	---	---	---	---	---	---	---
Zion----------	0-6	Sandy loam-------	SM, SC, SC-SM	A-2, A-4	0-5	85-100	85-100	50-100	20-50	0-25	NP-10
	6-16	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	95-100	90-100	85-100	80-95	41-80	20-50
	16-28	Gravelly clay, clay loam, clay.	CH, SC, GC	A-7	0-20	55-95	45-95	40-90	36-85	50-70	30-40
	28-33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
WzF*:											
Wynott----------	0-9	Sandy loam-------	SM, SC-SM, SC	A-2, A-4	0-5	85-100	85-100	60-85	25-55	15-30	NP-10
	9-17	Clay, clay loam, silty clay.	CL, CH	A-7-6	0-5	85-100	85-100	80-100	65-95	40-90	25-65
	17-37	Sandy clay, sandy clay loam, clay loam.	CL, SC	A-6	0-5	85-100	85-100	70-95	35-85	25-50	7-25
	37-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Zion----------	0-6	Sandy loam-------	SM, SC, SC-SM	A-2, A-4	0-5	85-100	85-100	50-100	20-50	0-25	NP-10
	6-16	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	95-100	90-100	85-100	80-95	41-80	20-50
	16-28	Gravelly clay, clay loam, clay.	CH, SC, GC	A-7	0-20	55-95	45-95	40-90	36-85	50-70	30-40
	28-33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.—Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
WzF*:											
Wilkes----------	0-6	Sandy loam-------	ML, SM	A-2, A-4	0-10	90-100	80-100	60-92	25-55	15-35	NP-7
	6-18	Clay loam, clay, sandy clay loam.	CL, CH	A-6, A-7	0-10	80-100	80-100	75-96	50-85	30-60	11-35
	18-45	Weathered bedrock	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 15.—Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
AkA----------	0-10	10-24	1.30-1.50	2.0-6.0	0.12-0.20	3.5-6.5	Low----------	0.24	5	.5-2
Altavista	10-36	18-35	1.30-1.50	0.6-2.0	0.12-0.20	3.5-6.0	Low----------	0.24		
	36-60	---	---	---	---	---	----------	----		
AmB----------	0-6	5-20	1.40-1.65	2.0-6.0	0.10-0.15	4.5-6.5	Low----------	0.24	4	.5-1
Appling	6-41	35-60	1.25-1.45	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.28		
	41-51	20-45	1.25-1.45	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28		
	51-60	---	---	---	---	---	----------	----		
ApD*, ApE*:										
Ashlar----------	0-15	5-15	1.30-1.55	2.0-6.0	0.08-0.15	4.5-6.0	Low----------	0.24	2	.5-1
	15-25	5-15	1.30-1.55	2.0-6.0	0.04-0.14	4.5-5.5	Low----------	0.24		
Pacolet---------	0-7	8-20	1.00-1.50	2.0-6.0	0.08-0.12	4.5-6.5	Low----------	0.20	3	.5-1
	7-25	35-65	1.30-1.50	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28		
	25-54	15-30	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28		
	54-60	10-25	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28		
BwB----------	0-10	3-12	1.60-1.75	>6.0	0.06-0.10	4.5-6.5	Low----------	0.10	5	.5-1
Buncombe	10-60	3-12	1.60-1.75	>6.0	0.03-0.07	4.5-6.5	Low----------	0.10		
CeB, CeC---------	0-8	5-20	1.30-1.50	2.0-6.0	0.12-0.14	4.5-6.5	Low----------	0.28	4	.5-1
Cecil	8-11	20-35	1.30-1.50	0.6-2.0	0.13-0.15	4.5-5.5	Low----------	0.28		
	11-48	35-70	1.30-1.50	0.6-2.0	0.13-0.15	4.5-5.5	Low----------	0.28		
	48-60	---	---	---	---	---	----------	----		
CfB2, CfC2-------	0-4	20-35	1.30-1.50	0.6-2.0	0.13-0.15	4.5-6.5	Low----------	0.28	3	.5-1
Cecil	4-50	35-70	1.30-1.50	0.6-2.0	0.13-0.15	4.5-5.5	Low----------	0.28		
	50-60	---	---	---	---	---	----------	----		
ChA----------	0-6	10-35	1.30-1.60	0.6-2.0	0.15-0.24	4.5-6.5	Low----------	0.28	5	1-4
Chewacla	6-32	18-35	1.30-1.50	0.6-2.0	0.15-0.24	4.5-6.5	Low----------	0.32		
	32-38	18-35	1.30-1.60	0.6-2.0	0.12-0.20	4.5-6.5	Low----------	0.28		
	38-65	---	---	---	---	---	----------	----		
Cr*:										
Chewacla--------	0-6	10-35	1.30-1.60	0.6-2.0	0.15-0.24	4.5-6.5	Low----------	0.28	5	1-4
	6-32	18-35	1.30-1.50	0.6-2.0	0.15-0.24	4.5-6.5	Low----------	0.32		
	32-38	18-35	1.30-1.60	0.6-2.0	0.12-0.20	4.5-6.5	Low----------	0.28		
	38-65	---	---	---	---	---	----------	----		
Roanoke---------	0-7	10-27	1.20-1.50	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.37	5	.5-2
	7-50	35-60	1.35-1.65	0.06-0.2	0.10-0.19	4.5-5.5	Moderate-----	0.24		
	50-72	5-50	1.20-1.50	0.06-20	0.04-0.14	4.5-5.5	Moderate-----	0.24		
GeD, GeE---------	0-5	15-25	1.35-1.55	0.6-2.0	0.11-0.17	5.1-6.5	Low----------	0.28	4	.5-1
Gwinnett	5-39	35-60	1.30-1.45	0.6-2.0	0.11-0.16	5.1-6.5	Low----------	0.28		
	39-53	24-40	1.35-1.50	0.6-2.0	0.12-0.18	5.1-6.5	Low----------	0.28		
	53-60	---	---	0.00-0.06	---	---	----------	----		
GwD2, GwE2-------	0-5	20-40	1.35-1.55	0.6-2.0	0.11-0.17	5.1-6.5	Low----------	0.28	4	.5-1
Gwinnett	5-37	35-60	1.30-1.45	0.6-2.0	0.11-0.16	5.1-6.5	Low----------	0.28		
	37-52	24-40	1.35-1.50	0.6-2.0	0.12-0.18	5.1-6.5	Low----------	0.28		
	52-60	---	---	0.00-0.06	---	---	----------	----		

See footnote at end of table.

Table 15.—Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
IrB, IrC----------	0-5	10-20	1.30-1.70	2.0-6.0	0.12-0.15	5.1-7.3	Low----------	0.28	3	.5-2
Iredell	5-24	40-60	1.20-1.45	0.06-0.2	0.16-0.22	5.6-7.3	Very high----	0.20		
	24-60	---	---	---	---	---	----------	----		
LdB, LdC----------	0-9	10-35	1.35-1.55	0.6-2.0	0.12-0.15	4.5-6.5	Low----------	0.28	5	.5-1
Lloyd	9-56	35-60	1.30-1.45	0.6-2.0	0.12-0.15	4.5-6.5	Low----------	0.28		
	56-60	7-35	1.45-1.65	0.6-2.0	0.10-0.14	4.5-6.5	Low----------	0.28		
LfB2, LfD2, LfE2-	0-6	10-35	1.35-1.55	0.6-2.0	0.12-0.15	4.5-6.5	Low----------	0.28	5	.5-1
Lloyd	6-48	35-60	1.30-1.45	0.6-2.0	0.12-0.15	4.5-6.5	Low----------	0.28		
	48-60	7-35	1.45-1.65	0.6-2.0	0.10-0.14	4.5-6.5	Low----------	0.28		
LuC*:										
Lloyd----------	0-9	7-20	1.45-1.65	0.6-2.0	0.10-0.14	4.5-6.5	Low----------	0.28	5	.5-1
	9-56	35-60	1.30-1.45	0.6-2.0	0.12-0.15	4.5-6.5	Low----------	0.28		
	56-60	7-35	1.45-1.65	0.6-2.0	0.10-0.14	4.5-6.5	Low----------	0.28		
Urban land.										
MaD, MaE----------	0-5	5-20	1.45-1.65	2.0-6.0	0.11-0.15	4.5-6.5	Low----------	0.24	4	.5-1
Madison	5-24	30-50	1.20-1.40	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	0.32		
	24-38	25-35	1.30-1.40	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.32		
	38-60	5-20	1.30-1.50	0.6-2.0	0.10-0.14	4.5-6.0	Low----------	0.37		
MdD2, MdE2-------	0-4	25-35	1.30-1.40	0.6-2.0	0.12-0.16	4.5-6.5	Low----------	0.28	3	.5-1
Madison	4-27	30-50	1.20-1.40	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	0.32		
	27-60	5-20	1.30-1.50	0.6-2.0	0.10-0.14	4.5-6.0	Low----------	0.37		
MeB, MeC----------	0-8	8-25	1.30-1.50	0.6-2.0	0.14-0.19	5.6-7.3	Low----------	0.24	4	.5-2
Mecklenburg	8-26	40-60	1.40-1.60	0.06-0.2	0.12-0.14	5.6-7.3	Moderate-----	0.28		
	26-33	20-35	1.40-1.60	0.6-2.0	0.12-0.14	5.6-7.3	Low----------	0.32		
	33-60	---	---	---	---	---	----------	----		
MoC----------	0-10	2-7	1.35-1.55	6.0-20	0.05-0.07	4.5-6.5	Low----------	0.10	5	.5-1
Molena	10-42	5-10	1.45-1.60	6.0-20	0.06-0.09	4.5-6.0	Low----------	0.17		
	42-60	<5	1.45-1.60	6.0-20	0.03-0.05	4.5-6.0	Low----------	0.15		
PaB, PaD, PaE----	0-7	8-20	1.00-1.50	2.0-6.0	0.08-0.12	4.5-6.5	Low----------	0.20	3	.5-1
Pacolet	7-25	35-65	1.30-1.50	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28		
	25-54	15-30	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28		
	54-60	10-25	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28		
PfB2, PfD2, PfE2-	0-6	20-35	1.30-1.50	0.6-2.0	0.10-0.14	4.5-6.5	Low----------	0.24	2	.5-1
Pacolet	6-18	35-65	1.30-1.50	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28		
	18-24	15-30	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28		
	24-60	10-25	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28		
PgE*:										
Pacolet----------	0-7	8-20	1.00-1.50	2.0-6.0	0.08-0.12	4.5-6.5	Low----------	0.20	3	.5-1
	7-25	35-65	1.30-1.50	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28		
	25-54	15-30	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28		
	54-60	10-25	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28		
Urban land.										
Pt*.										
Pits, quarry										

See footnote at end of table.

Table 15.—Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
RbB, RbC----------	0-8	7-20	1.40-1.55	2.0-6.0	0.07-0.14	4.5-6.0	Low----------	0.20	5	.5-1
Red Bay	8-22	10-25	1.30-1.60	0.6-6.0	0.10-0.14	4.5-6.0	Low----------	0.15		
	22-60	18-35	1.30-1.50	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.17		
ReF----------	0-7	5-20	1.30-1.50	2.0-6.0	0.08-0.12	4.5-6.5	Low----------	0.24	3	.5-1
Rion	7-36	18-35	1.40-1.50	0.6-2.0	0.08-0.15	4.5-6.5	Low----------	0.20		
	36-60	2-20	1.30-1.50	2.0-6.0	0.06-0.12	4.5-6.5	Low----------	0.20		
Rk----------	0-8	10-27	1.20-1.50	0.6-2.0	0.14-0.20	3.5-5.5	Low----------	0.37	5	.5-1
Roanoke	8-60	35-60	1.35-1.65	0.06-0.2	0.10-0.19	3.5-5.5	Moderate-----	0.24		
Sh----------	0-6	10-27	1.20-1.40	0.6-2.0	0.15-0.20	4.5-6.5	Low----------	0.28	5	.5-3
Shellbluff	6-60	18-35	1.20-1.50	0.6-2.0	0.12-0.22	4.5-6.5	Low----------	0.28		
ToA----------	0-4	2-15	1.40-1.55	2.0-6.0	0.09-0.12	5.1-6.5	Low----------	0.10	4	1-2
Toccoa	4-60	2-19	1.40-1.50	2.0-6.0	0.09-0.12	5.1-6.5	Low----------	0.20		
WeB, WeD, WeE----	0-5	5-20	1.25-1.60	2.0-6.0	0.10-0.18	3.6-5.5	Low----------	0.24	4	.5-1
Wedowee	5-32	35-45	1.30-1.50	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.28		
	32-60	15-30	1.20-1.50	0.6-2.0	0.08-0.15	3.6-5.5	Low----------	0.28		
WgE----------	0-5	6-20	1.25-1.60	2.0-6.0	0.08-0.12	3.6-5.5	Low----------	0.15	4	.5-1
Wedowee	5-35	35-45	1.30-1.50	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.28		
	35-60	15-30	1.20-1.50	0.6-2.0	0.08-0.15	3.6-5.5	Low----------	0.28		
WhB----------	0-7	8-15	1.45-1.65	2.0-6.0	0.11-0.16	4.5-6.0	Low----------	0.24	5	.5-1
Wickham	7-40	18-35	1.30-1.50	0.6-2.0	0.12-0.17	4.5-6.0	Low----------	0.24		
	40-60	---	---	---	---	---	----------	----		
WkD*:										
Wilkes----------	0-6	5-20	1.30-1.50	2.0-6.0	0.11-0.15	5.1-6.5	Low----------	0.24	2	.5-2
	6-18	20-45	1.40-1.60	0.2-0.6	0.15-0.20	6.1-7.8	Moderate-----	0.32		
	18-45	---	---	---	---	---	----------	----		
Zion----------	0-6	5-18	1.30-1.55	2.0-6.0	0.08-0.15	4.5-6.0	Low----------	0.28	2	.5-2
	6-16	35-60	1.20-1.50	0.06-0.6	0.10-0.19	4.5-7.3	High---------	0.28		
	16-28	35-50	1.30-1.60	0.2-2.0	0.07-0.15	5.1-7.3	High---------	0.17		
	28-33	---	---	0.00-0.01	---	---	----------	----		
WzF*:										
Wynott----------	0-9	5-20	1.30-1.65	2.0-6.0	0.11-0.15	4.5-6.5	Low----------	0.28	3	.5-2
	9-17	35-65	1.20-1.50	0.06-0.2	0.15-0.17	4.5-6.5	High---------	0.28		
	17-37	20-45	1.30-1.50	0.2-0.6	0.15-0.20	4.5-6.5	Low----------	0.28		
	37-60	---	---	0.00-0.06	---	---	----------	----		
Zion----------	0-6	5-18	1.30-1.55	2.0-6.0	0.08-0.15	4.5-6.0	Low----------	0.28	2	.5-2
	6-16	35-60	1.20-1.50	0.06-0.6	0.10-0.19	4.5-7.3	High---------	0.28		
	16-28	35-50	1.30-1.60	0.2-2.0	0.07-0.15	5.1-7.3	High---------	0.17		
	28-33	---	---	0.00-0.01	---	---	----------	----		
Wilkes----------	0-6	5-20	1.30-1.50	2.0-6.0	0.11-0.15	5.1-6.5	Low----------	0.24	2	.5-2
	6-18	20-45	1.40-1.60	0.2-0.6	0.15-0.20	6.1-7.8	Moderate-----	0.32		
	18-45	---	---	---	---	---	----------	----		

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 16.—Soil and Water Features

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness
					Ft			In	
AkA—Altavista	C	Rare	---	---	1.5-2.5	Apparent	Dec-Apr	>60	---
AmB—Appling	B	None	---	---	>6.0	---	---	>60	---
ApC*, ApE*:									
Ashlar	B	None	---	---	>6.0	---	---	23-40	Hard
Pacolet	B	None	---	---	>6.0	---	---	>60	---
BwB—Buncombe	A	Occasional	Very brief	Feb-Jun	>6.0	---	---	>60	---
CeB, CeC, CfB2, CfC2—Cecil	B	None	---	---	>6.0	---	---	>60	---
ChA—Chewacla	C	Frequent	Brief to long.	Nov-Apr	0.5-2.0	Apparent	Nov-Apr	>60	---
Cr*:									
Chewacla	C	Frequent	Brief to long.	Oct-Jul	+1.-3.0	Apparent	Oct-Jul	>60	---
Roanoke	D	Frequent	Very long	Oct-Jul	+3-0	Apparent	Oct-Jul	>60	---
GeD, GeE, GwD2, GwE2—Gwinnett	B	None	---	---	>6.0	---	---	51-60	Soft
IrB, IrC—Iredell	C/D	None	---	---	1.0-2.0	Perched	Dec-Apr	>60	---
LdB, LdC, LfB2, LfD2, LfE2—Lloyd	B	None	---	---	>6.0	---	---	>60	---
LuC*:									
Lloyd	B	None	---	---	>6.0	---	---	>60	---
Urban land.									
MaD, MaE, MdD2, MdE2—Madison	B	None	---	---	>6.0	---	---	>60	---
MeB, MeC—Mecklenburg	C	None	---	---	>6.0	---	---	>60	---
MoC—Molena	A	None	---	---	>6.0	---	---	>60	---

See footnote at end of table.

Table 16.—Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness
					Ft			In	
PaB, PaD, PaE, PfB2, PfD2, PfE2-Pacolet	B	None	---	---	>6.0	---	---	>60	---
PgE*:									
Pacolet	B	None	---	---	>6.0	---	---	>60	---
Urban land.									
Pt*.									
Pits, quarry									
RbB, RbC	B	None	---	---	>6.0	---	---	>60	---
Red Bay									
ReF	B	None	---	---	>6.0	---	---	>60	---
Rion									
Rk	D	Frequent	Brief	Nov-Jun	0-1.0	Apparent	Nov-May	>60	---
Roanoke									
Sh	B	Occasional	Brief	Dec-Apr	3.0-5.0	Apparent	Dec-Apr	>60	---
Shellbluff									
ToA	B	Frequent	Brief	Jan-Dec	2.5-5.0	Apparent	Dec-Apr	>60	---
Toccoa									
WeB, WeD, WeE, WgE	B	None	---	---	>6.0	---	---	>60	---
Wedowee									
WhB	B	Rare	---	---	>6.0	---	---	>60	---
Wickham									
WkD*:									
Wilkes	C	None	---	---	>6.0	---	---	15-20	Soft
Zion	C	None	---	---	>6.0	---	---	33-40	Hard
WzF*:									
Wynott	C	None	---	---	>6.0	---	---	37-40	Soft
Zion	C	None	---	---	>6.0	---	---	33-40	Hard
Wilkes	C	None	---	---	>6.0	---	---	15-20	Soft

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 17.—Classification of the Soils

Soil name	Family or higher taxonomic class
Altavista	Fine-loamy, mixed, thermic Aquic Hapludults
Appling	Clayey, kaolinitic, thermic Typic Kanhapludults
Ashlar	Coarse-loamy, mixed, thermic Typic Dystrochrepts
Buncombe	Mixed, thermic Typic Udipsamments
Cecil	Clayey, kaolinitic, thermic Typic Kanhapludults
Chewacla	Fine-loamy, mixed, thermic Fluvaquentic Dystrochrepts
Gwinnett	Clayey, kaolinitic, thermic Rhodic Kanhapludults
Iredell	Fine, montmorillonitic, thermic Typic Hapludalfs
Lloyd	Clayey, kaolinitic, thermic Rhodic Kanhapludults
Madison	Clayey, kaolinitic, thermic Typic Kanhapludults
Mecklenburg	Fine, mixed, thermic Ultic Hapludalfs
Molena	Sandy, mixed, thermic Psammentic Hapludults
Pacolet	Clayey, kaolinitic, thermic Typic Kanhapludults
Red Bay	Fine-loamy, kaolinitic, thermic Rhodic Kandiudults
Rion	Fine-loamy, mixed, thermic Typic Hapludults
Roanoke	Clayey, mixed, thermic Typic Endoaquults
Shellbluff	Fine-silty, mixed, thermic Fluventic Dystrochrepts
Toccoa	Coarse-loamy, mixed, nonacid, thermic Typic Udifluvents
Wedowee	Clayey, kaolinitic, thermic Typic Kanhapludults
Wickham	Fine-loamy, mixed, thermic Typic Hapludults
Wilkes	Loamy, mixed, thermic, shallow Typic Hapludalfs
Wynott	Fine, mixed, thermic Typic Hapludalfs
Zion	Fine, mixed, thermic Ultic Hapludalfs

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83°45'

83°30'

33°30'

33°15'

MORGAN COUNTY

NEWTON COUNTY

BUTTS COUNTY

MONROE COUNTY

JONES COUNTY

PUTNAM COUNTY

Shady Dale

Monticello

Murder Creek

Shoal Creek

Murder Creek

Creek

Lake Jackson

Ocmulgee River

Wise Creek

Creek

Gladdesville Creek

Cedar Creek

Creek

SOIL LEGEND*

1	Chewacla-Toccoa-Roanoke
2	Iredell-Mecklenburg
3	Lloyd-Cecil
4	Pacolet-Cecil-Lloyd
5	Molena-Madison-Red Bay
6	Wilkes-Madison-Zion
7	Lloyd-Gwinnett
8	Pacolet-Madison-Gwinnett

*The units on this legend are described in the text under the heading "General Soil Map Units."

Compiled 1992

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES
AGRICULTURAL EXPERIMENT STATIONS

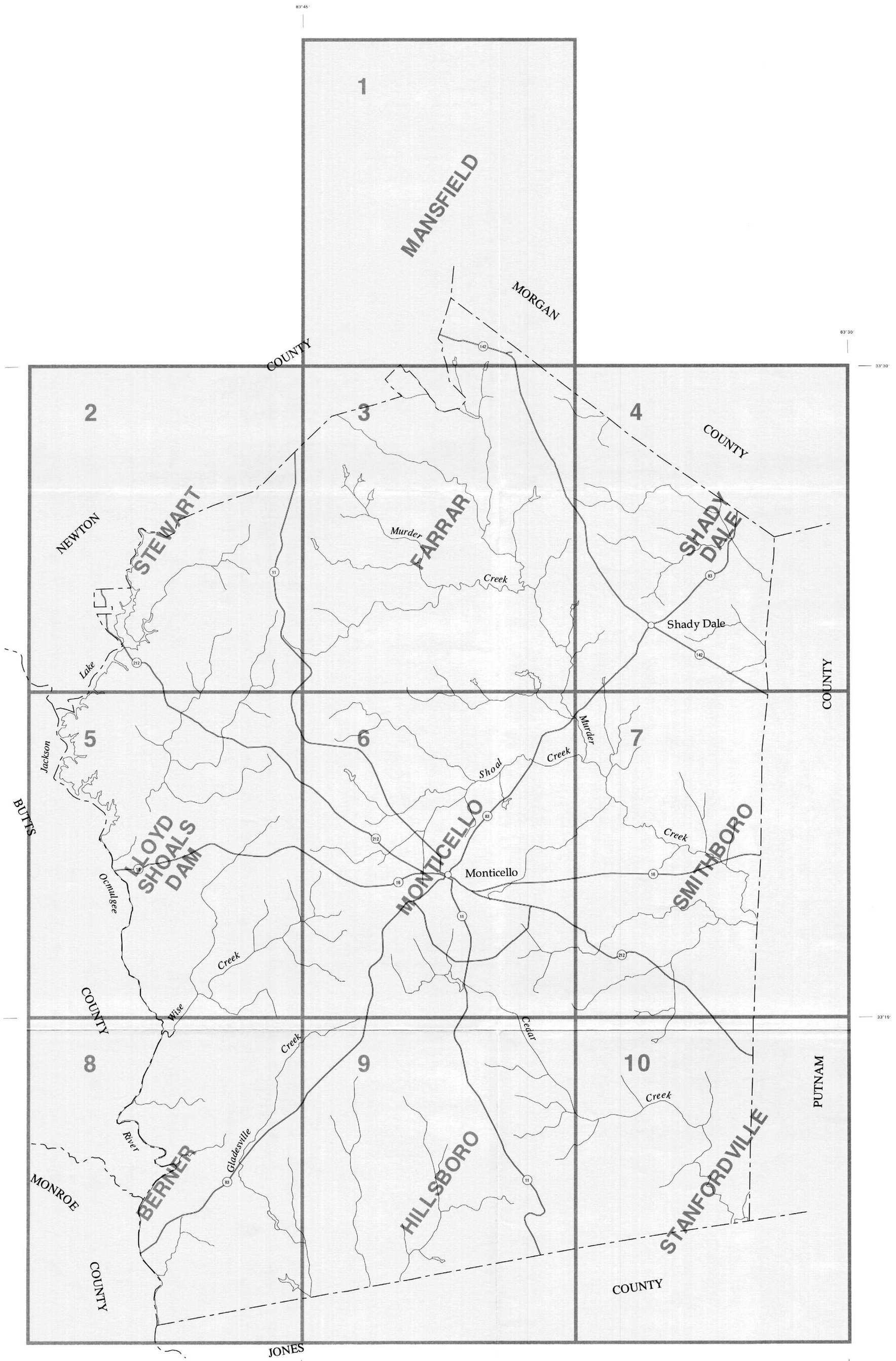
GENERAL SOIL MAP
JASPER COUNTY, GEORGIA

Scale 1:100000

3 0 3
MILES

6 0 6
KILOMETERS

Each area outlined on this map consists of more than one kind of soil. The map is meant for general planning rather than a basis for decisions on the use of specific tracts.



INDEX TO MAP SHEETS

JASPER COUNTY, GEORGIA

Scale 1:100000

3 0 3

MILES

6 0 6

KILOMETERS

SOIL LEGEND

Map unit symbols and names are alphabetical. Map symbols are letters or a combination of letters and numbers. The first letter is capitalized and is the first letter of the series (or miscellaneous area) name. The second letter is lower case, except for associations. The third letter, if used, is capitalized and denotes the slope phase. Soils without a slope letter are nearly lever soils or miscellaneous areas. The fourth character, if used, denotes class 2 erosion.

SYMBOL	NAME
AkA	Altavista sandy loam, 0 to 3 percent slopes, rarely flooded
AmB	Appling sandy loam, 2 to 6 percent slopes
ApD	Ashlar-Pacolet complex, 2 to 15 percent slopes
ApE	Ashlar-Pacolet complex, 15 to 25 percent slopes
BwB	Buncombe loamy sand, 0 to 6 percent slopes, occasionally flooded
CeB	Cecil sandy loam, 2 to 6 percent slopes
CeC	Cecil sandy loam, 6 to 10 percent slopes
CfB2	Cecil sandy clay loam, 2 to 6 percent slopes, eroded
CfC2	Cecil sandy clay loam, 6 to 10 percent slopes, eroded
ChA	Chewacla silt loam, 0 to 2 percent slopes, frequently flooded
Cr	Chewacla-Roanoke complex, 0 to 1 percent slopes, ponded
GeD	Gwinnet sandy loam, 6 to 15 percent slopes
GeE	Gwinnet sandy loam, 15 to 25 percent slopes
GwD2	Gwinnet sandy clay loam, 6 to 15 percent slopes, eroded
GwE2	Gwinnet sandy clay loam, 15 to 25 percent slopes, eroded
IrB	Iredell fine sandy loam, 0 to 6 percent slopes
IrC	Iredell fine sandy loam, 6 to 10 percent slopes
LdB	Lloyd loam, 2 to 6 percent slopes
LdC	Lloyd loam, 6 to 10 percent slopes
LfB2	Lloyd clay loam, 2 to 6 percent slopes, eroded
LfD2	Lloyd clay loam, 6 to 15 percent slopes, eroded
LfE2	Lloyd clay loam, 15 to 30 percent slopes, eroded
LuC	Lloyd-Urban land complex, 2 to 10 percent slopes
MaD	Madison sandy loam, 6 to 15 percent slopes
MaE	Madison sandy loam, 15 to 30 percent slopes
MdD2	Madison sandy clay loam, 6 to 15 percent slopes, eroded
MdE2	Madison sandy clay loam, 15 to 30 percent slopes, eroded
MeB	Mecklenburg loam, 2 to 6 percent slopes
MeC	Mecklenburg loam, 6 to 10 percent slopes
MoC	Molena loamy sand, 2 to 10 percent slopes
PaB	Pacolet sandy loam, 2 to 6 percent slopes
PaD	Pacolet sandy loam, 6 to 15 percent slopes
PaE	Pacolet sandy loam, 15 to 25 percent slopes
PfB2	Pacolet sandy clay loam, 2 to 6 percent slopes, eroded
PfD2	Pacolet sandy clay loam, 6 to 15 percent slopes, eroded
PfE2	Pacolet sandy clay loam, 15 to 25 percent slopes, eroded
PgE	Pacolet-Urban land complex, 10 to 25 percent slopes
Pt	Pits, quarry
RbB	Red Bay sandy loam, 2 to 5 percent slopes
RbC	Red Bay sandy loam, 5 to 12 percent slopes
ReF	Rion sandy loam, 15 to 40 percent slopes
Rx	Roanoke silt loam, 0 to 2 percent slopes, frequently flooded
Sh	Shellbluff loam, 0 to 2 percent slopes, occasionally flooded
ToA	Toccoa fine sandy loam, 0 to 3 percent slopes, frequently flooded
WeB	Wedowee sandy loam, 2 to 6 percent slopes
WeD	Wedowee sandy loam, 6 to 15 percent slopes
WeE	Wedowee sandy loam, 15 to 25 percent slopes
WgE	Wedowee gravelly sandy loam, 10 to 30 percent slopes, very stony
WhB	Wickham sandy loam, 0 to 4 percent slopes, rarely flooded
WkD	Wilkes-Zion complex, 6 to 15 percent slopes
WzF	Wynott-Zion-Wilkes complex, 15 to 35 percent slopes
W	Water

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

County or parish

Field sheet matchline and neatline

Cemetery

ROAD EMBLEM & DESIGNATIONS

State (52)

PITS

Borrow pit

Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

Church (rural only)

WATER FEATURES

DRAINAGE

Drainage end (indicates direction of flow)

Unclassified stream

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS (WzF, Aka)

SHORT STEEP SLOPES

SOIL SAMPLE (normally not shown) (S)

STANDARD LANDFORM AND MISCELLANEOUS SURFACE FEATURES

Gully

Gravelly spot

Rock outcrop

Sandy spot

Stony spot

Very stony spot

Wet spot

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JASPER COUNTY, GEORGIA
MANSFIELD QUADRANGLE
SHEET NUMBER 1 OF 10

83°45′00″ 83°42′30″ 83°40′00″ 83°37′30″

33°37′30″

33°35′00″

33°32′30″

33°30′00″

83°45′00″ 83°42′30″ 83°40′00″ 83°37′30″

(Joins sheet 3, Farrar)

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North American Datum of 1983 (NAD83). GRS-80 Spheroid Universal Transverse Mercator, zone 17. Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

1	2	3
4		5
6	7	8

1 JERSEY
2 SOCIAL CIRCLE
3 RUTLEDGE NORTH
4 COVINGTON
5 RUTLEDGE SOUTH
6 STEWART
7 FARRAR
8 SHADY DALE

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MANSFIELD, GEORGIA
7.5 MINUTE SERIES
SHEET NUMBER 1 OF 10

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JASPER COUNTY, GEORGIA
STEWART QUADRANGLE
SHEET NUMBER 2 OF 10

83°52'30" 83°50'00" 83°47'30" 83°45'00"

33°30'00" 33°27'30" 33°25'00" 33°22'30"

(Joins sheet 3, Farrar)

(Joins sheet 5, Lloyd Shoals Dam)

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North American Datum of 1983 (NAD83). GRS-80 Spheroid Universal Transverse Mercator, zone 17. Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

1	2	3
4		5
6	7	8

1 PORTERDALE
2 COVINGTON
3 MANSFIELD
4 WORTHVILLE
5 FARRAR
6 JACKSON
7 LLOYD SHOALS DAM
8 MONTICELLO

INDEX TO ADJOINING 7.5 MAPS

STEWART, GEORGIA
7.5 MINUTE SERIES
SHEET NUMBER 2 OF 10

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

(Joins sheet 1, Mansfield)

JASPER COUNTY, GEORGIA
FARRAR QUADRANGLE
SHEET NUMBER 3 OF 10

83°45′00″ 83°42′30″ 83°40′00″ 83°37′30″

33°30′00″ 33°27′30″ 33°25′00″ 33°22′30″

(Joins sheet 2, Stewart) (Joins sheet 4, Shady Dale)

(Joins sheet 6, Monticello)

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North American Datum of 1983 (NAD83). GRS-80 Spheroid Universal Transverse Mercator, zone 17. Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES

FEET

KILOMETERS

1	2	3	1 COVINGTON 2 MANSFIELD 3 RUTLEDGE SOUTH 4 STEWART 5 SHADY DALE 6 LLOYD SHOALS DAM 7 MONTICELLO 8 SMITHBORO
4		5	
6	7	8	

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FARRAR, GEORGIA
7.5 MINUTE SERIES
SHEET NUMBER 3 OF 10

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JASPER COUNTY, GEORGIA
SHADY DALE QUADRANGLE
SHEET NUMBER 4 OF 10

83°37'30" 83°35'00" 83°32'30" 83°30'00"

33°30'00" 33°27'30" 33°25'00" 33°22'30"

(Joins sheet 3, Farrar)

(Joins sheet 7, Smithboro)

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North American Datum of 1983 (NAD83). GRS-80 Spheroid Universal Transverse Mercator, zone 17. Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

KILOMETERS 1 0 1

1	2	3	1 MANSFIELD 2 RUTLEDGE SOUTH 3 MADISON
4		5	4 FARRAR 5 ROCK EAGLE LAKE 6 MONTICELLO
6	7	8	7 SMITHBORO 8 EATONTON

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SHADY DALE, GEORGIA
7.5 MINUTE SERIES
SHEET NUMBER 4 OF 10

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JASPER COUNTY, GEORGIA
LLOYD SHOALS DAM QUADRANGLE
SHEET NUMBER 5 OF 10

(Joins sheet 2, Stewart)

83°52'30" 83°50'00" 83°47'30" 83°45'00"

33°22'30" 33°20'00" 33°17'30" 33°15'00"

(Joins sheet 6, Monticello)

(Joins sheet 8, Berner)

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QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

	2	3	1 WORTHVILLE 2 STEWART 3 FARRAR
4		5	4 JACKSON 5 MONTICELLO 6 INDIAN SPRINGS
6	7	8	7 BERNER 8 HILLSBORO

INDEX TO ADJOINING 7.5 MAPS

LLOYD SHOALS DAM, GEORGIA
7.5 MINUTE SERIES
SHEET NUMBER 5 OF 10

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JASPER COUNTY, GEORGIA
MONTICELLO QUADRANGLE
SHEET NUMBER 6 OF 10

(Joins sheet 3, Farrar)

83°45′00″ 83°42′30″ 83°40′00″ 83°37′30″

33°22′30″ 33°20′00″ 33°17′30″ 33°15′00″

(Joins sheet 5, Lloyd Shoals Dam)

(Joins sheet 7, Smithboro)

(Joins sheet 9, Hillsboro)

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

1	2	3
4		5
6	7	8

1 STEWART
2 FARRAR
3 SHADY DALE
4 LLOYD SHOALS DAM
5 SMITHBORO
6 BERNER
7 HILLSBORO
8 STANFORDVILLE

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MONTICELLO, GEORGIA
7.5 MINUTE SERIES
SHEET NUMBER 6 OF 10

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JASPER COUNTY, GEORGIA
SMITHBORO QUADRANGLE
SHEET NUMBER 7 OF 10

(Joins sheet 4, Shady Dale)

83°37′30″ 83°35′00″ 83°32′30″ 83°30′00″

33°22′30″ 33°20′00″ 33°17′30″ 33°15′00″

(Joins sheet 6, Monticello)

(Joins sheet 10, Stanfordville)

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

MILES 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

KILOMETERS 1 0 1

1	2	3
4		5
6	7	8

1 FARRAR
2 SHADY DALE
3 ROCK EAGLE LAKE
4 MONTICELLO
5 EATONTON
6 HILLSBORO
7 STANFORDVILLE
8 RESSEAUS CROSSROADS

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SMITHBORO, GEORGIA
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NATURAL RESOURCES CONSERVATION SERVICE

(Joins sheet 5, Lloyd Shoals Dam)

JASPER COUNTY, GEORGIA
BERNER QUADRANGLE
SHEET NUMBER 8 OF 10

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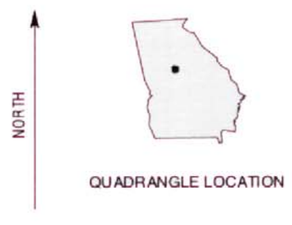

QUADRANGLE LOCATION

SCALE 1:24000

MILES 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

KILOMETERS 1 0 1

1	2	3
4		5
6	7	8

1 JACKSON
2 LLOYD SHOALS DAM
3 MONTICELLO
4 INDIAN SPRINGS
5 HILLSBORO
6 FORSYTH
7 EAST JULIETTE
8 DAMES FERRY

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BERNER, GEORGIA
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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JASPER COUNTY, GEORGIA
HILLSBORO QUADRANGLE
SHEET NUMBER 9 OF 10

(Joins sheet 6, Monticello)

83°45′00″ 83°42′30″ 83°40′00″ 83°37′30″

33°15′00″ 33°12′30″ 33°10′00″ 33°07′30″

(Joins sheet 8, Berner)

(Joins sheet 10, Stanfordville)

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

1	2	3	1 LLOYD SHOALS DAM 2 MONTICELLO 3 SMITHBORO
4		5	4 BERNER 5 STANFORDVILLE 6 EAST JULIETTE
6	7	8	7 DAMES FERRY 8 GRAY

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HILLSBORO, GEORGIA
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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JASPER COUNTY, GEORGIA
STANFORDVILLE QUADRANGLE
SHEET NUMBER 10 OF 10

(Joins sheet 7, Smithboro)

83°37′30″ 83°35′00″ 83°32′30″ 83°30′00″

33°15′00″ 33°12′30″ 33°10′00″ 33°07′30″

(Joins sheet 9, Hillsboro)

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
KILOMETERS

1	2	3
4		5
6	7	8

1 MONTICELLO
2 SMITHBORO
3 EATONTON
4 HILLSBORO
5 RESSEAUS CROSSROADS
6 DAMES FERRY
7 GRAY
8 HADDOCK

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STANFORDVILLE, GEORGIA
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